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EDITORIAL.

The Work of the State Board of Health.

THE reports of the analysts appointed under the act of 1881, to the State Board of Health, although fragmentary, appear to show that in the case of drugs and chemicals there is not much reason for complaint of general poor quality. Dr. Hoffman thinks that the six hundred and fifty-nine specimens of crude and powdered vegetable drugs and medicinal chemicals examined by him cannot be taken as representing the general character of the drugs and medicines dispensed in this State, since it is estimated that there are not less than two thousand and eight hundred drug stores proper, and three thousand other stores were drugs and medicines are sold.

Some of the analyses reported by Dr. Hoffman are of articles of no particular medicinal value. In the case of others the purity of which is essential, little sophistication was discovered. One out of seven specimens of codeia proved to be sulphate of morphia, two of seventeen specimens of iodide of potassium were found to be the bromide. Nineteen specimens of sulphate of quinine were examined, and two were found to be composed entirely of sulphate of cinchonidia, one contained an undue amount of this salt besides an admixture of lower cinchona alkaloids.

Professor G. C. Caldwell makes a report on quinine pills, in which he states the results of examining twenty-nine samples. He confined his examination to estimation of the amount of quinine sulphate in the samples received, without attempting to ascertain the extent to which other alkaloids were substituted for it to make up any deficiency. In every case the amount of sulphate of quinine was below that which the pills were professed to contain. Two-grain pills had only 0.9 to 1.8 grains of the proper salt; three-grain pills contained from 1.7 to 2.8 grain, while five-grain pills had from 2.4 to 4.7 grains.

Seidlitz powders and solution of citrate of magnesium were reported on by W. D. Tucker, of Albany (who was lately added to the number of analysts). Mr. Tucker is the only one who, so far as we observe, mentions the localities from whence the samples were derived. Of seventy-two seidlitz powders examined, thirty-five were collected in New York, and the remainder in Albany and vicinity. His conclusions are, that gross adulteration is probably uncommon. The weights of both the acid and the seidlitz mixture showed a great diversity, and, in many instances, the powders are without doubt intentionally manufactured of short weight. In about one-third the diminution in the proportion of Rochelle salt, and increase in the proportion of the cheaper bicarbonate of soda, were evidently intentional.

It cannot be said that the labors of the analysts have thus far been productive of any notable results. This is probably due to the fact that their duties are novel, and that they have not yet become known by the general public. So far as drugs and pharmaceutical preparations are concerned, there is probably but little adulteration, substitution or depreciation in value which is capable of being proven in a court. What the case may be with articles of food, we have yet to learn, but we shall be much mistaken if the analysts do not there find the principal field for their labor.

Jewish Pharmacists in Russia.

THE troubles of this race in Russia appear to be farther from an amicable settlement than before; one of the latest acts of the Government indicating that the popular sentiment receives official encouragment. During March the Minister of the Interior notified the fourteen Jewish proprietors of pharmacies in St. Petersburg that they would no longer be permitted to pursue their calling, and required them to dispose of their business within a year to pharmacists who are not Jews. Jewish assistants are required to resign their situations and cease the practice of pharmacy at once.

West Virginia Pharmacy.

AFTER prolonged effort, the amendment to the Pharmacy Act passed last year has been amended, and the Governor has reappointed the Commissioners of Pharmacy. Mr. Edmund Bocking, by whose efforts the enactment of the present law was secured, met with considerable opposition to his reappointment, but was finally confirmed. It is said that the opposition to the present act was largely on the part of wholesale dealers, and on account of the clauses relating to adulteration and the sale of liquor. Under the present law, retail pharmacists can only dispense alcoholic liquors on prescription. The new Board has already commenced work.

New Jersey Pharmaceutical Association.

JUST as we are going to press, we receive a notice from Messrs. E. S. Reed and Jos. P. Conly, the local Secretaries of this Association, announcing the twelfth annual meeting to be held in the City Hall at Atlantic City on Thursday, May 17th and 18th, at 11 o'clock. The headquarters of the Association will be in the Ocean House, where ample accommodations will be provided. An exhibition of drugs and chemicals will be held during the meeting.

REMEMBER that the N. Y. State Pharmaceutical Association meets at Albany in June (20th and 21st).

[ORIGINAL COMMUNICATION.]

The Melting Points of Petroleum Ointments, and a Trip into the Oil Country.

BY SAMUEL A. D. SHEPPARD.

THERE has been a desire, for some time past, especially among physicians, for a petroleum ointment that shall have a higher melting point than most of those now in the market

It has already been intimated that petroleum ointment will have a place in the coming pharmacopœia, and the only question which still appeared to be open was the melting point. Statements had been made to the effect that an ointment of high melting point could not be made without the admixture of foreign substances, and, in general, the knowledge of the preparation and properties of these products was so fragmentary that it was deemed advantageous to determine, by personal observation, the following points:

1st. Can petrolatum be made by filtration of any desired melting point between 95° F. and 120° F.?

2d. If such be the case, is the process so practical and the supply of crude material from which it may be made so abundant that, if the article should be directed to have a melting point not exceeding 120° F., pharmacists can readily obtain it?

With this interest in view, the writer left Boston at 3 P.M., March 14th, and arrived in Corry, Pennsylvania, the next day at noon.

An invitation had been received some months before from Messrs. Clark & Warren, oil refiners of Corry, to visit the oil country, and have carried on by them any experiments on this subject, in any way desired, at their works, where all the facilities for such experiments were ready at hand or could be easily furnished at short notice.

Mr. R. C. Clark, the senior partner of the firm, met me at the depot, and during the seven days spent in Corry and vicinity, he devoted his entire time to me, himself performing nearly all the experiments, and giving his constant personal attention to all of them, sometimes till late into the night, in order that I might see the work done in the most satisfactory manner.

He gave me in every possible way all the facilities needed in the investigation, and materially assisted me, a stranger in the oil region, to obtain information on any and all points that happened to arise, and I embrace this public opportunity to thank him, especially, for his courtesy, and also to thank his partner, as well as Mr. William H. Abbotts, of Titusville; Mr. W. R. Weaver, of the Emery Oil Company, Bradford; Mr. E. B. Frew, and Mr. Babcock, both connected with the United Pipe Lines at Warren; Mr. Edward E. Kattell, of Binghamton, N. Y.; Mr. S. C. Lewis, of the Chesebrough Manufacturing Company, New York, and many other gentlemen whom I met, all of whom, without exception, cheerfully and courteously gave me information with regard to various points connected with the subject.

Wednesday afternoon was occupied in thoroughly discussing the subject with Mr. Clark and others, and in making a careful inspection of the Oil Refinery Works of Messrs. Clark & Warren, in order to familiarize myself with the proposed materials, implements, and processes.

Having had previous knowledge of the nature of what is known as B. S. oil, my plan as laid out Wednesday evening was about as follows:

To distil and filter such B. S. oil as I could dip out of the bottom of Clark & Warren's crude oil six-thousand-barrel tank.

To go over to Warren, some twenty-five miles distant, to get a supply of B. S. oil from the United Pipe Lines that had been standing several years, and to distil and filter this sample. To go over to Bradford, the great centre of the present oil producing district, and examine personally the oil wells, and talk with oil men at the wells and in Bradford, and to obtain specimens of the heavy, crude, amorphous paraffin that sticks to the sucker-rods and clogs the pipes at the wells. Lastly, to experiment in any way that seemed best on my return to Corry.

This plan was carried out nearly as stated.

The agents of the United Pipe Lines in Warren were very courteous, and readily granted the request to take a half barrel of B. S. oil from their large wooden tank, saying that there was some four feet of the "stuff" in the tank, and if any plan could be devised to create a demand for it, all the oil men in this section would be pleased, as it is a nuisance everywhere, and the bulk of it is increasing every year in every tank. All the persons with whom I talked told the same story. The article is a nuisance; the bane of the oil men.

This half-barrel sample was expressed to Corry, and time being limited, we went direct from Warren to Bradford. Here as much time as was necessary was occupied in going around to the oil wells, in getting samples, and in consultation with oil men as to the quantity and quality of the B. S. oil and the sucker-rod production, or "rod wax," which articles seem to me to be both simply crude amorphous paraffin, differing in density and in the admixture of lighter products.

The "rod wax," which the oil producers simply designate as "paraffin," seems to be found in both "pumping wells" and "flowing wells;" but is not often found at a depth much lower than two hundred and fifty feet below the surface.

To clear the pipes of the "pumping wells," it is necessary to draw the "sucker rods" and use a jet of steam. In the "flowing wells," when the "rod wax" has accumulated sufficiently to stop the flow, the pressure of the gas below will, after a time, force the acccmulation out into the flowing tank—in other words, the well "cleans itself." This happens every few days or weeks or as often as may be.

The "rod wax" from the "flowing wells" is hence found at the bottoms of the "flowing tanks;" that from the "pumping wells" on or under the derrick floors, or wherever it may have been thrown to get it out of the way.

There are in the Bradford district nearly twelve thousand wells; at each of these wells there is usually one or more tanks. The Pipe Lines refuse to receive into their pipes some twenty barrels, more or less, from the bottoms of each of these tanks. This sediment is known as B. S. oil; a portion of it is water, but the greater part of it is a mixture of crude, amorphous paraffin, with a greater or less quantity of the lighter products. Its density is according to the character of the crude oil and the length of time the tank has been used.

In addition to the "producers' tanks," there are scattered all through the district immense iron tanks, each holding from twenty to thirty thousand barrels of crude petroleum. From the hill overlooking Bradford, we could count nearly one hundred of these large iron tanks, and as we rode from Bradford to Carrolton, many more. In each of these tanks is a sediment of B. S. oil.

The amount of this sediment, B. S. oil, now known to be on hand is probably not less than three hundred thousand barrels. An estimate made by reliable parties of the amount of "rod wax" that could be obtained at a fair price was from five to ten thousand barrels a year, the most of which is now thrown away.

Having obtained material with which to work, experiments were commenced at the refinery in Corry. Mr. Clark had had made a small sand pump, holding about two gallons, with a long rope attached. This could be used to get oil from the bottoms of the tanks.

The sand pump here mentioned may be described as follows:—It was an upright galvanized iron cylinder some six or eight inches in diameter and twenty inches long, open at the top, its bottom closed by a valve so arranged that as the cylinder sank down into the oil the valve remained open, and the cylinder sank through the various strata of oil as it would were it bottomless; but immediately on an attempt being made to draw the cylinder upward, the valve closed, and the cylinder could be drawn up to the surface, filled with oil from any stratum desired. Small iron legs,

three inches long, prevented the lower edge of the cylinder from reaching the bottom of a tank, the object being to thus prevent the taking up of water, a stratum of which is at the bottom of each tank.

He had also arranged a small still of about fifteen gallons' capacity, a cheese-box still, some twenty inches in diameter and about fifteen inches high, with iron piping seven-eighths of an inch in diameter, to serve as inlet and outlet tubes, the vapor of the lighter products being carried through the wall to the outside of the building through a similar iron tubing, and thence through some thirty or more feet of iron tubing as a condenser. The temperature of the atmosphere being somewhat below freezing, this made a pretty fair condenser, cold water being poured on occasionally.

A small pipe was arranged to conduct a jet of steam to the bottom of the inside of the still.

The still was incased in brickwork; the heat applied was that obtained from an ordinary wood-fire, great care being used not to allow the heat to get too strong.

With the sand pump some seven gallons of the sediment were drawn from the bottom of Clark and Warren's crude-oil tank with which to charge the still. This oil was not a good specimen of B. S. oil, because it had been standing only about one month, and was not so thick as could have been desired.

Very shortly after the heat was applied to the still, benzin commenced to run. As the distillate came over, its gravity was tested every few minutes. The first run stood at about 70° Beaumé; it very soon came down to 65° and to 60° Beaumé.

I was told that I could not judge fairly of the quantity and gravity of the light products, owing to the smallness of the quantity and the character of the stock used; but I was not so much interested in the distillate as in the residuum.

When the distillate stood at about 50° B., a small jet of steam was turned on, the force being afterwards increased somewhat. The use of steam serves to help drive off the lighter porducts more completely and at a lower temperature.

At 40° B., wax was struck, and the distillation was stopped by removing the heat from the still. To "strike wax" is a term used to denote that point in the process of distillation at which the distillate shows the presence of paraffin wax, by the latter congealing on the cool edges of the condensing tubes or otherwise.

The still was allowed to stand undisturbed until it was presumed that its contents were sufficiently cooled not to take fire on exposure to the air, yet not long enough to get cold. Mr. Clark stated that there would have been great danger of fire, had the residuum been drawn off at once, when the heat was removed, as the temperature was probably from 500° to 600° F., or higher. The residuum was then drawn off slowly into an open pan. Its temperature was 320° F.; quantity about two and a half gallons.

An ordinary heavy tin cone-bottom percolator, with a stop-cock, had been arranged in a box closed on three sides, one of the three sides being arranged as a door.

The percolator was eleven inches in diameter, and its perpendicular sides were twenty-two inches in height.

A perforated metal diaphragm, three inches in diameter, was placed over the outlet tube; this diaphragm was covered with a piece of unbleached cotton, over which was placed some ordinary cotton batting. Thus prepared, the percolator was ready to receive the animal charcoal and the residuum.

Coarse animal charcoal had been heated to a red-heat for about one-half hour to free it from bone odor. This charcoal was now only quite warm, so cool that it could be easily handled with the bare hands. The warm charcoal was packed firmly in the percolator to the depth of six inches, and the hot residuum, having stood now in the air about a half-hour, was poured on. The open side of the box, in which the percolator was arranged, was so placed as to receive a current of hot air, and thus the temperature of the air in the box was kept constantly at from 180° to 200° F.

The first run from the percolator was quite light-colored. It soon commenced to grow darker in color, and by the time a half-gallon had passed, it was evident that a second filtration would be necessary.

The product was very sweet and free from odor, but was not so heavy as desired (having a melting point of 100° F.), and it was decided not to spend any more time on it, but to get another lot of ten gallons of oil from the bottom of the tank, and distil and proceed with the distillation until the distillate should have a gravity of but 37° B.

This was at once done; the temperature of the residuum when running from the still was 380° F., and, when cooled, it had a melting point of 102° F., and the melting point of the filtered product was the same.

Experiments were made to test the melting points at various stages in the process of filtration, but, in the quantity that we were handling, there was comparatively little difference, though the general rule of oil men, that "repeated filtrations lessen the cold test," proved true. In other words, the more filtering, the higher the melting point.

Two lots of ten gallons each of the B. S. oil, from Warren, were distilled and filtered. The gravity of this oil was 36° Baumé.

The distillation of the first lot was carried on until the distillate had a gravity of 40° B. The temperature of the residuum, when running from the still, was 360° F., and the filtered product had a melting point of 100° F.

The distillation of the second lot was carried on until the distillate had a gravity of 34° B. The temperature of the residuum, when running from the still, was 380° F., and the melting point of the filtered product was 110° F.

One lot of three gallons of crude paraffin that causes the clogging of the wells, "rod wax," was distilled and filtered.

The residuum from it was about 80% of the amount used. The temperature, when running from the still, was 400° F., and the melting point of the filtered product was 138° F.

A lot, consisting of a mixture of two gallons of the sediment from Clark & Warren's tank and one gallon of rod wax was distilled and filtered. The temperature of the residuum, when running from the still, was 405° F., and the melting point of the finished product was 130° F.

One lot, consisting of a mixture of two gallons of the sediment from Clark & Warren's tank and one-half pound of commercial paraffin wax was distilled and filtered. The temperature of the residuum, when running from the still, was 380° F., and the melting point of the filtered product was 110° F.

The object of this experiment was to have a sample known to contain crystalline paraffin wax, and, by future examination, to judge of the homogeneous character of a preparation when the admixture was made previous to distillation. There is so much cracking or splitting up in these paraffins that it is not always easy to say what may occur till an experiment has been made.

A quantity of *very dirty* rod wax had been brought from one of the wells in Bradford. It was the worst specimen that we could find. This was placed in an open pan in a very warm place, allowed to stand thirty-six hours, strained through cotton, and filtered through animal charcoal. The melting point of the finished product was 140° F.; color and odor very good, and, by repeated filtrations, it was made nearly white.

An experiment was made by filtering a small lot of very nice inodorous petrolatum through ordinary animal charcoal. The filtrate was quite offensive in odor, especially when warmed.

A similar experiment was tried with ground, unburned bones, and gave a product that, when hot, was simply disgusting in its odor, as, of course, I expected it would be.

Complaints have frequently been made by dermatologists that the petroleum ointments of the markets are sometimes irritant in their action. This can probably be explained by the fact that sufficient care is not always used to have the animal charcoal, which is used for filters,

properly purified. It can be purified by heating it to five to seven hundred degrees F. for, say, half an hour, the heating being done a comparatively short time before using the charcoal. If the charcoal be not freed from impurities, the petroleum product, when filtering through it, will be likely to absorb the condensed noxious gases, and thus may become, not only an offensive, but an irritant instead of an emollient application.

A specimen of what is known as "tar," was obtained from the oil works of Messrs. Downer & Co., at Corry. It is the residuum left in the petroleum still when the distillation has been carried to 23° to 18° Baumé. From this "tar," by destructive distillation, paraffin oils and wax are obtained, coke being left in the still. By congelation and pressure, the paraffin wax is separated from the oils. No experiments were made with this "tar," as it did not seem to have a bearing on the subject in hand.

The writer has now on hand specimens of all the crude materials used in the foregoing experiments, and also of the products obtained therefrom.

Of one fact the writer was thoroughly convinced, as he watched the slow, tedious processes of filtration through animal charcoal. It was that, in the future, pharmacists will probably use, for some purposes, a petroleum ointment that is not so thoroughly decolorized as the nice articles now found in our markets.

The process of filtration is the expensive part of the manufacture of this article. A general estimate that would be fair, would probably be that from three hundred parts of residuum, but one hundred parts of the nice light straw-colored goods can be obtained; it being necessary to use so much charcoal that the two hundred parts are absorbed by it, for the charcoal absorbs about one-half its weight of the residuum. If an article not quite so nearly decolorized could be used, it could be furnished by the manufacturers at a much lower price than they are now obliged to ask for it, and the question now arises, Is the very light-colored product really any better than one slightly colored, yet equally free from odor?

The writer does not feel competent to answer, but he thinks that it is a question worthy of consideration, for it seems probable that if a somewhat darker-colored product, equally free from odor, should be found equally good as a base for ointments, it could be furnished at a low price, say eight to ten cents a pound, less than is now paid for good lard. The residuum can be deodorized without the use of animal charcoal, and the opinion was freely expressed by intelligent persons, familiar with the subject, that the residuum deodorized, not filtered, is a good dressing for wounds.

Leaving Corry at noon, March 22d, I went to Binghamton, N. Y., and the next morning had a very pleasant and instructive visit of a couple of hours at the Binghamton oil refinery. Mr. Edward E. Kattell, one of the proprietors, courteously showed me the whole process of the manufacture of petrolina, the petroleum ointment put on the market by them. They do not use the residuum from the still in making petrolina, preferring to make it by deodorizing a mixture of "rod wax" and some lighter product in proper proportions, and filtering the deodorized mixture through animal charcoal. The lighter product used is either crude petroleum oil or some one of the paraffin series of oils that may be somewhat unsalable.

Mr. Kattell thinks that the supply of rod wax is limited, but that should it become scarce, they would make the goods from heavy B. S. oil, by distilling it and then deodorizing and filtering the residuum, whereby they can get an ointment that shall have a melting point of 115° F.

Mr. Kattell does not think that an ointment of a higher melting point than 115° F. can be made without the use of rod wax, but a comparatively small quantity of rod wax would be sufficient to stiffen the 115° F. goods made from "tank bottoms" B. S. oil, so that they would have a melting point of 120° to 125° F., and there is no probability that the supply of rod wax will entirely cease.

Passing through New York on my way home, I called at the office of the Chesebrough Manufacturing Company to gather information on the subject of the melting points of petroleum ointments. Mr. Chesebrough was not in, but I had the pleasure of a very pleasant interview with Mr. S. C. Lewis, the vice-president of the company. He discussed the matter at some length, and gave in detail the position of the company in regard to the melting point to be adopted in the coming pharmacopœia. It was, that, from information gathered by them from many reliable sources, the consumers of the article will be best satisfied if they can have two preparations, the one having a melting point of 100° F., and the other 115° F. He also stated that the company is ready to furnish an article that should have any melting point desired below 125° F., and at the same time be entirely homogeneous, with no admixture of paraffin wax. He courteously invited me to visit their manufactory at some future time, though he could not of course reveal the trade secrets of the company. He stated that his opinion, as a manufacturer, was that if a melting point higher than 115° F. should be adopted, it would probably cause the market to be flooded with preparations that would not be homogeneous, but would have an undesirable granular character, as he thought manufacturers would resort to other ingredients as admixtures, that would deteriorate the quality.

The writer would have liked to have visited Philadelphia in order to see the process for the manufacture of cosmoline, but was not able to do so.

The conclusions arrived at may be summed up as follows:

Although the term paraffin may be and is properly applied chemically to any one of the long series of hydrocarbons, commencing with marsh gas and running up through the benzins, the illuminating oils, and the lubricating oils to paraffin wax, the usage of trade really confines the term paraffin to those of the series that are solid or semi-solid at ordinary temperature. It is in the latter sense that the term will be used in the following remarks.

Petroleum, as it comes from the earth, may be said to be capable of division into three parts by distillation, viz., into what may practically be termed two series of oils: the benzin oils and the paraffin oils and paraffin wax.

The division between the two series of oils may be said to occur in the process of distillation when very carefully conducted, when the gravity of the distillate has been reduced to about 42° to 41° Baumé.

The benzin oils are colorless or white oils, and have a peculiar benzin odor. They are also said to have a definite boiling point.

The paraffin oils are yellow or straw-colored oils, and have a greasy or waxy odor.

The oils in the paraffin series are very easily split up into other and lighter products of the same series by the skilful application of heat.

The article desired as a base for ointments by physicians and pharmacists is really amorphous paraffin mixed with a certain amount of one or more of the above-mentioned series of paraffin oils, but entirely free from admixture with any of the benzin series or the *crystalline* paraffin wax.

The benzin oils, if present, give an objectionable odor, and the crystalline paraffin wax, if present, will, in time, especially if the article be exposed to a low temperature, render it granular and cause it to separate, thus losing that homogeneous character so desirable in an ointment.

The question now is how to obtain this desired article. From all crude petroleum oils paraffin settles to a greater or less degree, so that if a tank containing two hundred and fifty barrels has been used at a well for three or four years, it may be expected to contain at the bottom of the tank a deposit, ranging in depth from four to eight inches, of a mixture containing a large proportion of paraffin. This paraffin is always in an amorphous condition, the crystalline character being found only in those products that have been subjected to the process of distillation.

Observations show that this amorphous paraffin and the harder varieties that clog the pipes may be easily obtained in quantities sufficient for all the demands of medicine and

pharmacy. We have therefore ready formed for us in Nature's laboratory the article we desire, but it is contaminated by oils of the benzin series, with odorous and coloring matter; the oils are gotten rid of by careful distillation, and the other by filtration through animal charcoal.

The harder variety, "rod wax," is the article that may be used to advantage to increase the melting point of petroleum ointment. Its melting point being about 140° F., and it being an amorphous and not a crystalline paraffin, it can be mixed, when purified, with goods of a lower melting point, to make a homogeneous article, as is shown by samples of such mixture that have stood more than a year. It is better, however, that the admixture be made previous to distillation. It is necessary that the animal charcoal, used as a filtering medium, be freed *by recent burning* from condensed noxious gases or other impurities.

To obtain petroleum ointment of a desired melting point it is necessary to *start* right, that is, to select such crude material as will, by distillation or purification in some way, give a residuum having the wished-for melting point. It is the opinion of the writer that to obtain an article having a melting point anywhere from 100° to 120° F., such crude material can be obtained easily, abundantly, and at a fair price, and that if a demand should be created for such an article, the demand will be quickly supplied.

The above conclusions are given as the opinions of the writer, derived from careful thought and experiment in the past, and now confirmed by observations and experiments under circumstances where it would seem that just conclusions might be formed.

While the writer does not presume that he has developed any hitherto unknown facts, and certainly will not object to any just criticisms, he hopes to add a little interest to the study of this subject, and to stimulate research in a direction to which pharmacists in the past have given too little thought and attention.

BOSTON, MASS.

Treatment and Cure of Nasal Catarrh.

DR. N. FFALLIOTT, writing to the *British Medical Journal*, states that coryza or nasal catarrh may be cured in a few hours if taken at the onset, or at at most twelve hours afterwards, by the inhalation of a spray of sulphate of quinine. The solution used is made by dissolving four grains of quinine in an ounce of water, with just sufficient dilute sulphuric acid to dissolve it, and scenting with any agreeable perfume. The solution is injected up the nostrils in the form of spray with an ordinary hand-ball spray producer in such a way that the quinine can be tasted at the back of the mouth. This is done at every hour or oftener, according to the urgency of the symptoms. He states that this remedy has been tried with success in hay fever, and that if nasal catarrh is of parasitic origin, as he strongly suspects, the action of quinine (as an antiseptic?) is at once apparent. It might be added that, even supposing catarrh to be the result of sudden change of temperature, the action of quinine in contracting the superficial capillaries would be quite as obvious. It is somewhat surprising that this property of quinine does not appear to have been tried for chilblains in the itching state, when the capillary vessels are dilated.

Diastase from Eggs.

ACCORDING to Selmi, egg-albumen contains a diastatic ferment. If egg-albumen is mixed with three volumes of water, and then with a sufficient quantity of alcohol to precipitate the albumen, a substance remains in solution which can transform starch into sugar, in aqueous solution.

Artificial diastase, that is, a mixture of albumen bodies and phosphates (which mixture is capable to convert soluble starch into sugar), is produced, if the albumen, precipitated as above directed, is several times washed with water on the filter, then boiled with a dilute solution of acid sodium phosphate, and the whole filtered. The resulting filtrate converts three times as much soluble starch into sugar as a pure solution of acid sodium phosphate.—*Ber. d. Deutsch. Chem. Ges.*, 1882, 386.

[ORIGINAL COMMUNICATION.]

The Quality of the Pancreatins of the Market.

BY D. C. MORIARTA, PH.G.*

I HAVE been induced to make some simple experiments with pancreatins by the circumstance of having had occasion to prepare peptonized milk for physicians' orders, and also to dispense pancreatin prescribed for the same purpose, to be used in the sick-room.

I also thought it a timely subject, as there seems to be considerable interest taken in pancreatin at this time, the result, I believe, of the publication of the "Lectures on the Digestive Ferments," by William F. Roberts, M.D., and the work "Indigestion and Biliousness," by Dr. Fothergill. Although the very important part performed by the pancreatic secretion in the process of digestion has been long understood, pancreatin has not, I think, been very much esteemed as a remedy in the past, owing to the great doubts felt as to the probabilities of its exerting much effect when given by the stomach, as it is most conclusively shown that pancreatic digestion goes on naturally "in alkaline or neutral media."

In the former book, much information is given upon the application of peptonized foods—milk, gruel, jellies, beef, etc., etc., for which second purpose an active preparation of the pancreas can be employed with great facility. Dr. Fothergill recommends pancreatin "guarded with bicarbonate of soda," and the conclusions of both these writers are that pancreatin given when the stomach is most free from its acid secretion, may be expected to produce good results.

My experiments were made principally according to the instructions laid down by Dr. Roberts, and with the practical aim to ascertain the utility of the pancreatin of the market for the preparation of peptonized milk, and to find the amount required of the various brands to represent in activity the two or three drachms of the liquor pancreaticus employed by Dr. Roberts.

The directions of Dr. Roberts for preparing peptonized milk are as follows:

Two or three drachms of liquor pancreaticus are put into a suitable vessel with twenty grains of bicarbonate of sodium and four (4) ounces of water; to this is added a pint of milk previously heated to 140° F., and the covered vessel is then set aside in a warm place until digestion is complete, which is in about one or two hours, if of proper strength. Slight physical changes go on which can easily be distinguished after a little experience, and the development of a bitter taste is a satisfactory evidence of the peptonizing of the milk.

When this is accomplished, the milk should give no precipitate with acetic or nitric acids, showing the absence of any undigested albumen or casein.

In all the experiments, the proportion of milk, soda, and water were used as above given, and kept at a temperature of 100° F. The first trial was made with the two makes apparently free from sugar or starch, and very similar in appearance—one of them an English preparation. It was found that each of these two, designated Nos. 1 and 2, *completely* peptonized a pint of milk by the use of five (5) grains in less than one (1) hour. Their action was very apparent at once, and nitric acid gave no curd or precipitate.

Six other kinds were then taken—designated Nos. 3, 4, 5, 6, 7, and 8—and tested with four (4) grains to a fluid ounce of milk. After several hours, two, Nos. 3 and 4, showed some evidence of digestion, the other four not the slightest.

These four, Nos. 5, 6, 7, and 8, were then used in the proportion of sixty (60) grains to half a pint of milk, and placed at 100° F. After several hours, as they showed no change, and lumps of curd were separated upon addition of acid, the bottles were still allowed to continue in the drying closet, and the four kinds again tried with sixty

* Abstract of a Thesis presented to the College of Pharmacy of the City of New York, 1882.

(60) grains to four (4) ounces, or 240 grains to a pint, and placed in the warm chambers.

Result of last trial, 60 gr. to 4 fl. ℥, after four or five hours, as follows: Nos. 5 and 7 showed no change—same taste and odor as when pancreatin was first added, and characteristic of the respective articles; nitric acid gave copious curdy precipitate.

Nos. 6 and 8 showed no signs of digestion, but the milk separated in each case into two layers, the lower a mass of cheesy curd, conforming to the shape of the bottle, the upper layer consisting of whey.

Then Nos. 5, 6, 7, and 8, with sixty (60) grs. to one-half pint, which had now been standing from 11 A.M. until 11 P.M., were examined, and still gave no evidence of digestion, and the contents of each bottle bore the same characteristic appearance as already noted.

It seemed to me that the milk had not spoiled, as no signs of this could be found in taste or smell, which is possibly due to the presence of sodium bicarbonate.

In the mean time, I had made further tests with Nos. 3 and 4, one hundred (100) grains to one pint of milk, and found peptonizing could be accomplished in three or four hours. In all these experiments, the ingredients were digested in tightly-corked vials.

The several makes were all obtained in original packages from wholesale houses.

No. 1, English, 5 grains to pint of milk at 100° F., digested in less than one hour.

No. 2, American, 5 grains to pint of milk at 100° F., digested in less than one hour.

No. 3, American, 5 grains to pint of milk at 100° F., remained fluid with nitric acid, but slight granular precipitate in three hours.

No. 4, American, 100 grains to pint of milk at 100° F., remained fluid with nitric acid, but slight granular precipitate in three hours.

No. 5, American, 240 grains to pint of milk at 100° F., not digested in ten hours.

No. 6, American, 240 grains to pint of milk at 100° F., not digested in ten hours.

No. 7, American, 240 grains to pint of milk at 100° F., not digested in ten hours.

No. 8, American, 240 grains to pint of milk at 100° F., not digested in ten hours.

The reaction of these pancreatins with starch was tested, as suggested by the following note from Dr. Roberts' lectures:

"If a test-tube half filled with an active extract of pancreas and a few drops of starch mucilage be quickly shaken herewith, you cannot detect the reaction of starch or dextrin, no matter how quick you may be with the testing—the transformation has followed upon the reaction as quick as the explosion of the charge follows the pull of the trigger.

"Between these two extremes there are all gradations."

I employed the tests in the following manner: I took eight test-tubes and weighed into each two grains of one of the kinds of pancreatin, then three (3) fluid drachms of water were poured into each tube, and well shaken. Tube No. 1 containing pancreatin No. 1—the make designated by the same number in the milk test; tube No. 2 containing make No. 2, and so on, each kind with same number as in milk test, in order that comparative activity upon milk and starch could be readily seen.

To tube No. 1 a few drops (7) of starch mucilage, made by Roberts' formula,* were added, and after shaking, quickly followed by a drop of tincture of iodine, and again shaken, and so on with each tube. The results were as follows:

Tube No. 1.—Slight reddish-brown color from dextrin, at point of contact with iodine, instantly disappearing upon shaking; no reaction with starch.

No. 2 showed the same reaction as No. 1.

No. 3.—Blue starch reaction, which gradually changed to reaction of dextrin in a few hours, and finally disappeared entirely.

No. 4.—Deep-blue reaction of starch, unchanged after standing all night.

No. 5.—Deep-blue reaction of starch, unchanged after standing all night.

No. 6.—Deep-blue reaction of starch, unchanged after standing all night.

No. 7.—Deep-blue reaction of starch, unchanged after standing all night.

No. 8.—Deep-blue reaction of starch, unchanged after standing all night.

More starch mucilage was then added to tubes Nos. one (1) and two (2) in quantities successively of drops twenty (20), drachms one (ʒ i.), and drachms one (ʒ i.), making drachms two (ʒ ii.), and twenty-seven (27) drops in all, giving dextrin reaction in increasing degrees, and quickly becoming colorless, showing no reaction of starch or dextrin.

* 1 grain starch in 100 cubic centimeters of water, boil, and make up to 100 *cc.*

Some Experiments on the Action of Organic Matters upon Silver Salts.

BY HENRY LEFFMANN, M.D.,*

Microscopist to the Pennsylvania State Board of Agriculture.

THE action of organic matter upon silver salts is well known, but I am not aware of any attempts to utilize this method for the examination of water. The following experiments were undertaken as a sort of preliminary investigation. The subject of water analysis is so important, and so much remains to be done, that every observation of the kind must have some value.

If we add a salt of silver to ordinary water, the precipitated chloride interferes with the test, and to prevent this I used a solution containing marked excess of ammonia. In the following experiments, the proportion used was 2 *cc.* of ammonio-nitrate of silver to 100 *cc.* of the water.

This silver solution contained only a few grains to the ounce. When not otherwise mentioned, the water was exposed to the sunlight for two hours.

1. Distilled water ..... No color.
2. Schuylkill water ..... No color.
3. Schuylkill water with 0.1 *cc.* urine..... Brown color.
4. Schuylkill water with 0.5 *cc.* urine..... Deep-brown.
5. Schuylkill water with 0.02 *cc.* urine..... Red-brown.
6. Schuylkill water with 4 grs. raw sugar..... No color.
7. Schuylkill water with 2 grs. stale mash .. Yellowish.
8. Well water, not perfectly pure, but not unfit to drink.... .... Faint-black.
9. Well water, markedly contaminated, Black precipitate almost immediately.
10. Water from a small stream, quite pure..... No color.

Waters containing small amounts of milk, glucose, and albumen gave no distinct effects. Solution of glue produced a faint brown. All the experiments tended to show that the test was very sensitive to the presence of urine. Some experiments were made with highly dilute solutions of the common active principles.

Quinidia, strychnia, and cinchonidia gave no result. Picrotoxin gave light-yellow; caffeine gave light-yellow; quinidine sulphate gave faint-brown; morphia gave immediate precipitate.

I hope to present before long the results of some further study of the matter.

* From *The Analyst*, March, 1882.

Synthesis of Thymol.

OSCAR WIDMAN has succeeded in preparing thymol artificially, by starting from cuminol or cumin-aldehyde, a constituent of oil of cumin, oxidizing with nitric acid, treating the product with phosphorus pentachloride, and, afterwards, with metallic zinc, whereby cymidin is produced. The latter, finally, is converted into thymol by means of nitrous acid.—*Ber. d. Deutsch. Chem. Ges.*, 1882, 167.

[ORIGINAL COMMUNICATION.]

The Solubility of the Officinal Morphia Salts in Water and Alcohol.

BY J. U. LLOYD.

IN compliance with a request received from the Chairman of the Committee of Revision of the U. S. Pharmacopœia several months ago, I have made a series of experiments to determine the solubility of the officinal morphia salts in water and alcohol, at 60° F., and at their boiling points.* Since my results differ from accepted authorities to a greater or less extent, I shall detail the experiments in a more elaborate manner than would otherwise be necessary. The experiments were performed with the salts made by Powers & Weightman, but, on repeating them with those made by Rosengarten & Sons and by Chas. T. White & Co., not much difference was noted.

Experiment with Cold Water.—In carrying on this line of experiments I added an excess of each morphine salt to separate portions of distilled water and placed the vessels, securely stoppered, in a situation where the temperature could not rise above 60° F. The act of solution was permitted to proceed for a period of four days, the vessels being frequently shaken. A constant watch was made during working hours, that the temperature should be as near 60° F. as possible (never rising above that degree) and each night the vessels were placed where the temperature remained somewhat less than 58° F. The weighing was made during the evening of the fourth day, previous to which for some hours the temperature had remained between 59° and 60° F. Each solution was finally carefully decanted into an evaporating dish from the considerable excess of morphine, quickly weighed and permitted to evaporate spontaneously. Then the weight of the crystals was determined, and in this manner the relation between solvent and salt.

Probabilities of Error.—The precautions regarding temperature avoided all chance of supersaturation. Inasmuch as filtration was not employed, evaporation of solvent could not have occurred to an appreciable extent between the acts of decanting and weighing the solutions. The liability of the morphine salt to contain different amounts of water of crystallization is thus the only probable source of error occurring to my mind, excepting blunders in manipulation or in calculation.

Experiments with cold alcohol.—The plan of procedure in this case was similar to that with cold water. The alcohol used was of specific gravity 0.820.

Probabilities of Error.—In this line of experiment, the composition of the salt recovered from alcoholic solution in crystalline form is assumed to be the same as though it had been crystallized from water. Such I do not know to be the case. The alcohol may abstract more or less water of crystallization, and fail to take its place in like amount, if at all, thus leading us into a slight errror.

Experiments with Boiling Water.—In this line, I use a small tubulated retort, the neck of which is inclined upward, and connected closely with an upright Liebig's condenser, whereby the vapor of the boiling liquid is returned to the retort as fast as formed. The material to be dissolved is introduced in portions through the tubulure of the retort, care being taken to permit the contents of the retort to partially cool before each removal of the stopper, thus avoiding loss of vapor. When the boiling liquid refuses to take up a few crystals of the salt, it is accepted as saturated.

Probabilities of Error.—There is constantly more or less vapor from the liquid inside the retort and condenser, and considerable condensed water on the sides of both vessels as it passes from the condenser to the retort. To overcome this source of error, previous to each experiment I bring to a boil within the retort the amount of water that I expect to use in the experiment, and pour out that which remains. When I add the fresh portion of water, I assume that the vapor and condensation will balance that of the previous experiment, thus actually permitting the salt to remain in contact with the amount of water I introduce. The line of investigation with boiling alcohol was carried on in a manner similar to the above.

ACETATE OF MORPHINE.

109.55	parts	water, 60° F.,	dissolved	9.35	parts	= 1 to 11.70.
61.6	"	" boiling,	"	45.8	"	= 1 " 1.34.
136.7	"	alcohol 60° F.,	"	2.0	"	= 1 " 68.30.
151.2	"	" boiling,	"	11.4	"	= 1 " 13.30.

Note.—Acetate of morphine is liable to lose acetic acid by exposure, and hence a portion of it is insoluble in water. If we attempt to determine the point of saturation in the manner employed, with perfectly soluble and stable salts, we will find that apparently the salt is dissolved in small amount. In consequence of this fact, we cannot judge of its point of saturation by appearance. To overcome this feature of the case, I used a large excess of the salt with my experiments with cold water, so that the liquid was actually saturated with acetate of morphine. With boiling water, I was forced to cautiously add traces of acetic acid to bring the morphine present to the state of an acetate. This I accomplished by touching the solution, after each period of boiling, with a glass rod moistened with glacial acetic acid. In this manner, without increasing the bulk of the solution, and without rendering it acid, I arrived at the desired end. Of course, as an *acid* solution is a free solvent of morphine salts, the experiments would have been valueless had I used a weak acid as my solvent.

The fact that acetate of morphine is not so soluble in alcohol as the alkaloid morphine, may have led me into a slight error, for the solution in alcohol doubtless gave an advantage in this direction, as the acetate used contained a perceptible amount of morphine.

HYDROCHLORATE OF MORPHINE.

288.9	parts	water, 60° F.,	dissolved	12.4	parts	= 1–23.40.
61.6	"	" boiling,	"	119.9	"	= 1– 0.51.
119.2	"	alcohol, 60° F.,	"	1.9	"	= 1–62.70.
151.2	"	" boiling,	"	4.9	"	= 1–30.80.

SULPHATE OF MORPHINE.

315.4	parts	water, 60° F.,	dissolved	15.6	parts	= 1– 21.60.
61 6	"	" boiling,	"	81.3	"	= 1– 0.75.
280.6	"	alcohol, 60° F.,	"	0.4	"	= 1–701.50.
705.6	"	" boiling,	"	4.9	"	= 1–144.00.

All parts are understood to be by weight.

* Prof. Frederic P. Power, Ph.D., of Philadelphia, has likewise, recently, investigated the solubility of sulphate of morphine in water. The text-books give the solubility as 1 in 2 at ordinary temperature. Dr. Edward R. Squibb first pointed out that the solubility was much less, about 1 in 15. Prof. Power determined the rate of solubility gravimetrically by ascertaining the amount of barium sulphate produced by the dissolved salt. He found the solubility to be 1 in 24. He also ascertained that sulphate of morphine does not form supersaturated solutions. Mr. Lloyd's paper has been in our hands for some time, and his experiments were conducted independently of those of Prof. Power.—ED. N. R.

The Bad Effects of Iodoform.

PROF. KÖNIG, of Göttingen, desires information respecting any cases of death or cerebral disturbance following the use of iodoform, the employment of which in surgical practice is greatly increasing of late.

Boracic Acid Poisoning.

A RUSSIAN physician gives the following resumé of symptoms following the use, in two cases, of a five-per-cent solution of boracic acid for washing out a pleural cavity and a large lumbar abscess. In the former a quantity of the solution was allowed to remain in the pleural space. Constant vomiting; hiccough; erythema, commencing on the face; a slight temporary elevation of temperature and a diminution in the contractility of the heart, proceeding to complete cardiac paralysis.—*Medical Times.*

[Original Communication.]

The Modern Prescription Case.

BY SAMUEL A. D. SHEPPARD.

This, like many another good thing, is one of the improvements of the age.

In "ye good olden time" when medicine and mystery went hand in hand, the apothecary compounded his mixtures in secret. No vulgar eye must witness the mysterious processes by which the compound was formed that should be the elixir of life to the suffering one.

Let us look at the subject, if we can, so as to learn something as to what constitutes the ideas on which the prescription desk or case is built, though perhaps we should first ask the question, Should there be such a thing at all?

As the pendulum swings from one side away to that which is directly opposite, so we of the human race are apt to go from one extreme to the other.

Let us try to find the golden mean on this subject, for the half-way house is generally a good place to rest.

Whereas the old apothecary looked very wise and took his prescription off into a secluded room, some modern pharmacists put up the prescription just as they would "a good dose of senna and salts with a little manna in it."

They do not believe in a prescription case and use the open counter.

This plan is exemplified, though not to its limit, in a drug store in Boston, one of the best conducted stores in the United States, and one in which it is probable that a larger number of prescriptions are daily compounded than in any other store in New England.

The simple counter, however, is so far modified that it has an elevated front and is placed in a retired part of the store.

The plan was, however, for a long time exemplified to its fullest extent by another of Boston's first-class stores, for here a simple counter was used directly across the end of the store, the most prominent possible place.

But the owner of the latter store has changed his plan and now uses a prescription case.

As we look the country over, we shall find that the drift of the best pharmaceutical thought of our day is most certainly in favor of a prescription case.

The prescription, with its curious characters, bringing down to our times as it does a remembrance of the old Grecian mythology, for the crossed ℞ is nothing more nor less than the relic of the old symbol of a prayer to mighty Jupiter for his blessing on the medicine, seems to deserve, even in this practical modern age, a certain consideration, such respectful treatment as its importance demands.

It is that part of our business that savors of the professional character, and though, of course, there is no money in it, yet the most of us take a little pride in doing a large prescription business, if for no other reason than because, to a certain extent, it is an index of the character of the store.

It also serves to draw in other legitimate drug trade. The family trade in nurse bottles, tooth brushes, bay rum and perfumery, to say nothing of patent medicines, is likely to go to the same store where the family has its prescriptions made up.

Therefore we cultivate the prescription and try to do it honor by a little extra attention.

Granted then that a prescription case is desirable, what sort of a case shall it be?

In answering this question we shall all of us at once find ourselves in a position whence it is hard for us to give an unprejudiced reply. In a matter of this sort, habit is second nature.

Let any man use a certain kind of prescription case for five, ten, or twenty years, and it will be difficult for him to realize that his own case is not, on the whole, about right.

But let us try to answer the question as well as we can by looking into the principles that are to govern us in building our model case.

We want to have a somewhat retired place where the mind can, for the time being, be concentrated on the important work, which, if carelessly performed, may send a confiding customer to an untimely grave; this place to be such as will secure us from the thoughtless conversation of outsiders.

Yet we do not want to arouse the suspicions of our customer by hiding away from him; for, though he may understand but little of what we are doing, yet, anxious for his friend or himself, the waiting customer somehow feels a little better if he can see for himself what is going on; can see that the scales balance, and that there is no slouchy or dirty manipulation.

For these reasons let the case be placed in the most quiet part of the store, and let it be surrounded with a framework of glass so high that the customer cannot stand with his chin over the top, and give us his valuable advice as we work; yet so arranged that he can look in if he desires to do so.

Five feet would seem to be the minimum height at which any prescription case should be built.

Shall there be a top to our case?

The top serves to keep out much dirt and dust; yet, again, it may serve to detain undesirable vapors and gases, and, as a rule, it is not ornamental, having a somewhat boxy look, and the open top case is certainly more airy and pleasant.

How high should the working-bench be? Mine is 38 inches high, and that seems to me just right.

Now, as to the style of architecture and location.

The case deserves and should have a prominent, convenient, and well-lighted position. Though in a retired place, it should be one of the marked features of the store. It should be an ornament to the establishment—the *sanctum sanctorum* of the place; no laughing nor jesting there, but sober, earnest thought.

The style will, of course, be in keeping with the general style of the store, but, as a rule, the plainer and simpler, the more practical it will be.

It should be of such a character as to be easily kept clean; for, in compounding medicines, cleanliness is next to accuracy.

Having built and located our prescription case, how shall we furnish it?

We unhesitatingly answer, just as completely as it is possible to do, in every respect.

Collect in and about it, so far as you can, everything that is needed in putting up a prescription, so that you will have to leave your case just as seldom and as short a distance as possible.

Should you wish to use a scruple of bicarbonate of sodium, it looks much nicer to weigh it out of a nicely-labelled two- or four-ounce bottle from the shelf in your prescription case than to have your customer see you take it from a big clumsy drawer, holding fifteen or twenty pounds.

Therefore, make your list of prescription-case bottles as complete as you can.

Let the mortars, the graduates, and the spatulas be so placed as to be right at hand when needed, and let them all be scrupulously clean. Let the mortars be clean on the outside as well as on the inside, and the glass of the graduates be brightly polished, and let there be enough of them.

Our customer is looking at us, and though he may not be able to tell ipecac from jalap and calomel, he can tell and he does notice what the condition of our implements is.

As the draught of cold water seems to taste better from the thin and finely cut glass than from the coarse, heavy vessel, so the medicine may be more palatable if prepared and presented in nice shape; indeed, the demand for elegant pharmaceutical preparations is one of the most imperious of the modern public.

To have as many things close at hand in the prescription case as may be, it is very desirable to have a great many drawers. Put them in wherever room can be spared, and let them be partitioned off so that the different sizes and styles of pill and powder and ointment boxes may be separated each from the other; also, the different sizes of corks and clean prescription bottles—all ready for use, so that there may be no unnecessary delay caused by having to

fumble around in a drawer to find what is needed. Let there be a small desk on or near the prescription case, with labels all cut and carefully arranged in it.

The question now arises, should there be any reference books on the prescription desk? A pharmacopœia, a dispensatory, a hand-book of botanical names, or a dose-book?

Perhaps so; yet it would seem that in the majority of cases, when it is necessary to consult a book, it would be better to do so out of sight of the customer, for, especially to the ignorant person, consulting a book sometimes suggests the idea that you do not quite understand that recipe; and to deserve and to have the absolute confidence of our customers should be our ambition.

Therefore, it would seem that if a book-shelf can be arranged a little on one side, out of sight, it would be the most desirable plan.

As to the prescription scales, the style and the arrangement of pill tiles, etc., etc., much might be said, but to sum it all up, the best that we can afford is none too good for this choice spot in our stores.

Let each of us make an effort, by every means in our power, to learn what are the most practical and useful items as to our prescription case, and having learned what is good, carry it out in our own stores so far as we can.

BOSTON, MASS.

A New and Delicate Test-Paper for Gaseous Ammonia.

WHEN fuchsine is dissolved in water and dilute sulphuric acid added, its red color will be changed to a yellowish-brown (the mono acid becomes converted into the di- or tri-sulphate). If strips of unsized paper be dipped in a not too dilute solution of rosaniline and dried, they will appear—similar to turmeric—of a beautiful yellowish color.

Paper prepared in the above described manner is permanently colored carmine-red by gaseous ammonia. The action of the ammonia is to convert the poly-acid rosaniline into a monacid fuchsine. This paper is of use for the detection of ammonium salts when they are present in small quantities. The substance to be tested is placed in a bottle and moistened with calcium hydrate. The bottle is closed with a piece of the test-paper attached to the lower part of the stopper. It is best to employ the paper when it is in a dry state, because when it is moistened it becomes bluish and its change to red is not so readily perceptible. In order to hasten the decomposition of the ammonium salts, the bottle with its contents may be warmed, as the paper is not affected by steam. By this means a beautiful red color may be produced with 0.0005 grams of ammonium chloride, and 0.0005 grams ammonium carbonate in a very short while. When it is exposed to the air it is liable to be attacked by moisture, though only after some time; it is therefore best to preserve it in well-closed vessels. It cannot, however, be kept indefinitely, as it is too fragile, whereupon it is best to prepare a fresh supply.—*Chemiker Zeitung*, V., 952.

The Brunelli Process of Embalming.

THE so-called "Brunelli process" of embalming is as follows:—1. The circulatory system is cleansed by washing with cold water till it issues quite clear from the body. This may occupy from two to five hours. 2. Alcohol is injected so as to abstract as much water as possible. This occupies about a quarter of an hour. 3. Ether is then injected to abstract the fatty matter. This occupies from two to ten hours. 4. A strong solution of tannin is then injected. This occupies for imbibition two to ten hours. 5. The body is then dried in a current of warm air passed over heated chloride of calcium. This may occupy two to five hours. The body is thus perfectly preserved, and resists decay. The Italians exhibit specimens which are as hard as stone, retain the shape perfectly, and are equal to the best wax models. It will be observed in this process that those substances most prone to decay are removed, and the remaining portions are converted by the tannin into a substance resembling leather.

False Belladonna Root.

IN the *Pharmaceutical Journal* of March 11th, MR. E. M. HOLMES contributes the following article:

In a previous paper attention was directed to the fact that the root of *Scopolia japonica* was being imported from Japan under the name of belladonna root,* and subsequently, at an Evening Meeting of the Pharmaceutical Society,† a specimen of an another substitute for belladonna root, differing entirely from the Japanese drug, was exhibited. A few weeks ago, some specimens of both these roots were sent to me for identification from a provincial town. It appears desirable, therefore, as the false belladonna roots are to all appearance likely to be distributed through the country, to publish a figure of the false root and to give an account of the means by which it may easily be distinguished from the true belladonna root.

The root here alluded to has been identified by Professor Flückiger as that of *Medicago sativa*, and is stated by him to be sometimes met with on the continent as an adulterant of belladonna root.

In size and color the medicago root closely resembles that of belladonna, but differs in the following particulars:—

The crown of the root is divided into three or four woody branches which are solid. The tap-root is hard and woody and broken only with difficulty. The outer surface is more or less covered with small scattered warts, and when scratched with the nail does not leave a white mark. The transverse section presents a woody structure and

Root of *Medicago sativa*.—*a*, transverse section of root. *b*, transverse section of belladonna root.

when it is wetted the cortical portion is seen to be of a white color with a yellowish meditullium traversed by a number of white medullary rays (fig. *a*). When the transverse surface of the root is moistened, a leguminous odor, somewhat resembling that of the pea, becomes perceptible, and the flavor is similar. The taste of the root is at first sweet like that of licorice and afterwards bitter and somewhat acrid, irritating the fauces.

Belladonna root is generally crowned with the *hollow* bases of the leafy stems, and the epidermis is easily scratched off by the nail, leaving a white starchy spot wherever abraded. The transverse surface of the root ex-

* *Pharm. Journ.* [3], x., p. 789.
† *Pharm. Journ.* [3], xii., p. 490.

hibits a narrow cortical portion of a yellowish or pale-brown color, divided by a dark line from the large meditullium or central portion. The latter is also of a pale-brown color, and shows irregularly scattered through its substance, but more numerous towards the cortical portion, a number of darker dots (fig. *b*), which when examined through a lens are seen to be vascular bundles in which the openings of the large porous vessels are visible, the vessels being surrounded by a few wood cells which give the dark color to the dots. The taste of the root is starchy and slightly bitter, without subsequent acridity. The root breaks with ease. Both the medicago and the belladonna contain starch, the grains being much larger and more muller-shaped in belladonna, and forming sometimes duplex or triple granules; other granules appear circular or oblong oval, according to their position. In medicago the starch grains are somewhat similar, but smaller. There are also present in the latter root a number of linear-oval grains, presenting a well-marked linear hilum. There is much less starch in the root than in belladonna, and the iodine test therefore gives a comparatively faint reaction. Neither root appears to contain tannin. The best marks by which to distinguish the medicago root, therefore, are the radiated structure of the meditullium, its woody character, and consequent resistance when an attempt is made to fracture it.

It may be added that the root was of German origin, and that those who wish for genuine root would do wisely to order the English grown drug, which is collected and prepared with more care.

Emulsions.

BY PROF. C. LEWIS DIEHL.

AMONG the many preparations that manufacturers of pharmaceutic specialties have made much capital out of in recent years, emulsions of cod-liver oil take a very prominent place. From the claims set forth in their advertisements—which may be either by label, by circular, or by the personal interview of the manufacturer's agent—one is easily led to believe that not alone superior knowledge and skill are requisite in their production, but also that their successful production is possible only with the aid of expensive machinery and the advantages that are derived from abundant capital and a particularly favored market. Yet nothing is further from the truth; for while it is not disputed that a certaia amount of knowledge and skill are required, that machinery is a necessity to the production of emulsions in large quantities, and that capital and a good market are advantageous in a commercial sense, their production requires no more knowledge and not as much skill as does the compounding of most of the prescriptions daily put up in our pharmacies, while all the apparatus necessary are a mortar and a pestle and accurate implements of measurement. These, with good, fresh cod-liver oil—which can be obtained without difficulty—make the production of an emulsion as easy an operation as the compounding of the simplest prescription. Moreover, such emulsions possess real advantages over the manufactured article. They are, in the first place, perfect emulsions, which the commercial products in many cases are not. Then, being prepared at the time when they are prescribed, they are absolutely fresh; and there is perhaps no class of preparations in which this is more desirable. It is true that the manufacturers usually claim that their emulsions keep well; but at the same time they are very careful to recommend that such be kept in a cool place. The truth is that, notwithwithstanding such care, the preparations furnished soon undergo change, become unsightly and unfit for use; and if it is further considered that this care in their preservation cannot always be observed, and, as a rule, is disregarded both by the wholesaler and retailer, it cannot be wondered that manufactured emulsions are often dispensed in a very unsatisfactory condition.

These considerations have suggested to me the propriety of offering some formulas for emulsions, in the hope that in the absence of authoritative formulas, physicians may find them of sufficient merit to adopt them in their practice; giving them at the same time the assurance that careful pharmacists following them will succeed as well as I have succeeded in preparing them.

The successful formation of emulsions, whether of fixed or volatile oils, is dependent upon certain rules, well understood by accomplished pharmacists, which, when deviated from, will invariably embarrass the operator, either by retarding or completely preventing perfect emulsification. These rules are:

1. That the water and gum arabic* shall be in definite and absolute proportion to each other. This proportion is three (3) parts of water to two (2) parts of gum, both by weight.

2. That the relation of oil to gum (and water) shall be definite within certain limits; that is to say, the mucilage formed in the above proportions is capable of perfectly emulsifying a minimum and a maximum proportion of oil. The minimum proportion is two (2) parts of oil to one (1) part of gum; the maximum proportion is four (4) parts of oil to one (1) part of gum.

3. That the trituration of the oil, gum, and water be continued until a perfectly homogenous, milky-white, thick creamy mixture is formed—*i. e.*, until perfect emulsification takes place—before the addition of a further quantity of water or other liquid.

The thick creamy emulsion obtained, if the above conditions are fulfilled, must be the basis of all perfect emulsions. It will bear dilution to any extent with water, forming mixtures varying, according to the proportion added, from the appearance and consistence of cream to that of very thin milk. Obviously the water may be substituted by solutions of saline compounds, syrups, etc., and this enables the production of the various combinations of cod-liver oil in current use from the above thick-creamy emulsion, which for distinction I shall designate as—

I. *Concentrated Emulsion of Cod-liver Oil.*—Take of fresh Norwegian cod-liver oil, eight (8) troy ounces; powdered gum arabic, two (2) troy ounces; distilled water, three (3) troy ounces. First weigh the gum into a wedgewood or porcelain mortar, then the oil, and triturate till the gum is well mixed with the oil; then weigh into the mixture the distilled water, and triturate the whole briskly until the mixture thickens and acquires a pasty consistence and milky whiteness. Now scrape down the portions adhering to the sides of the mortar and to the pestle, and continue the trituration for a short time, after which add such other ingredients as may be desirable, or transfer the concentrated emulsion to a wide-mouthed bottle for future use.

This concentrated emulsion will keep for a reasonable lime in cold weather, and, if placed in the ice-chest, also during warm weather. It may therefore be kept in stock if the demand for emulsions is brisk enough to justify it; but inasmuch as its preparation does not consume more than five or ten minutes, it is advised to always prepare it fresh, or, at all events, never to prepare more than a week's supply, particularly in summer. Its consistence is such that it is poured out of the containing vessel with difficulty; hence, the necessity of using one with a wide mouth, which should be as securely stoppered as possible, and should be cleaned very carefully each time it is refilled. All this takes time and involves trouble, which is prevented by preparing the concentrated emulsion only as required.

II. *Simple Emulsion of Cod-liver Oil.*—Take of concentrated emulsion of cod-liver oil thirteen (13) troy ounces; oil of wintergreen, twenty-four (24) drops; syrup, one (1) fluid ounce; water, three (3) fluid ounces. Weigh the concentrated emulsion into a mortar, add the oil of wintergreen, and triturate thoroughly; then gradually add first the water and then the syrup.

* The writer is well aware that other emulsifying agents have been proposed and are used, but he is satisfied that none of these answer as well as does gum arabic.

The manipulation for this emulsion is typical for all the other cod-liver oil emulsions given below. It has the consistence of very thick cream, but is readily poured out of narrow-mouthed bottles; is milky white, and mixes readily with water or other liquids that may be administered with it. It contains exactly fifty per cent (by volume) of oil, the quantity that manufactured emulsions are said to contain; although I have convinced myself that some of them do not contain that proportion. The oil of wintergreen disguises the odor of the cod-liver oil very admirably, and has the further advantage that it acts as a preservative.

III. *Emulsion of Cod-liver Oil with Hypophosphite of Lime.*—This differs from the simple emulsion in that one hundred and twenty-eight grains of hypophosphite of calcium are dissolved in the water, each tablespoonful of the finished emulsion containing four grains of that salt.

IV. *Emulsion of Cod-liver Oil with Hypophosphites of Lime and Soda.*—This differs from the simple emulsion in that one hundred and twenty-eight grains of hypophosphite of calcium and ninety-six grains of hypophosphite of sodium are dissolved in the water, each tablespoonful of the finished emulsion containing four grains of the calcium and three grains of the sodium salt.

V. *Emulsion of Cod-liver Oil with Hypophosphites.*—This differs from the simple emulsion in that one hundred and twenty-eight grains of hypophosphite of calcium, ninety-six grains of hypophosphite of sodium, and sixty-four grains of hypophosphite of potassium are dissolved in the water; each tablespoonful containing four grains of the calcium, three grains of the sodium, and two grains of the potassium salt, and corresponding to a teaspoonful of Churchill's syrup of the hypophosphites.

VI. *Emulsion of Cod-liver Oil with Phosphate of Lime.*—This differs from the simple emulsion in that two hundred and fifty-six grains of phosphate of calcium are dissolved in the water by the aid of one hundred and twenty-eight grains of hydrochloric acid;* each tablespoonful containing eight grains of the phosphate held in a pleasantly-acid solution.

VII. *Emulsion of Cod-liver Oil with Phosphate of Lime and Soda.*—This differs from the simple emulsion in that two hundred and fifty-six grains of phosphate of calcium and sixty-four grains of phosphate of sodium are dissolved in the water acidulated with one hundred and twenty-eight grains of hydrochloric acid; each tablespoonful containing eight grains of the calcium and two grains of the sodium salt.

VIII. *Emulsion of Cod-liver Oil with Lactophosphate of Lime.*—This differs from the simple emulsion in that two hundred and fifty-six grains of lactate of calcium dissolved in two fluid ounces of diluted phosphoric acid are substituted for two fluid ounces of the water, each tablespoonful containing eight grains of lactate of lime or about ten grains of lactophosphate.

IX. *Emulsion of Cod-liver Oil with Wild-cherry Bark.*—This differs from the simple emulsion in that the oil of wintergreen is substituted by eight drops of oil of bitter almonds, and in that one fluid ounce of the fluid extract of wild-cherry bark is substituted for one fluid ounce of the water; each tablespoonful containing fifteen minims of the fluid extract and one-fourth of a drop of oil of bitter almonds.

Other combinations of cod-liver oil with different medicinal agents may be effected in the same way as pointed out in the above, or the proportions of salts may be varied to suit particular cases. The process for the concentrated emulsion also may be applied to the emulsification of other oils, as, for instance, in the following:

X. *Emulsion of Castor-Oil.*—Take of castor-oil, four (4) troy ounces; powdered gum arabic, one (1) troy ounce; distilled water, one and one-half (1½) troy ounces; syrup, cinnamon water, of each three (3) fluid ounces; spirit of cinnamon, twelve (12) minims. Emulsify the oil with the gum and distilled water as directed under I., then add the other ingredients successively with constant trituration. This emulsion contains thirty-three per cent of castor-oil, and is consequently more limpid than the fifty-per-cent cod-liver oil emulsions above described, and is in every respect an elegant preparation.—*Louisville Med. News.*

* The use of hydrochloric acid instead of phosphoric acid is preferred, because the large quantity of the latter required would make the preparation unpleasantly sour.

On the Assay of Spiritus Ætheris Nitrosi.*

BY PROF. J. F. EYKMAN, OF TOKIO.

THE so-called spiritus nitri dulcis is one of those remedies the normal constituents of which are not definitely ascertained, and for the assay of which no accurate method is known. Although the spirit is described in many chemical works as a simple solution of ethyl nitrate in alcohol, still none of the pharmacopœias has a process according to which the resulting preparation would consist solely of ethyl nitrite and alcohol. Even when following the directions of the British and United States Pharmacopœias, where the use of copper prevents as much as possible the production of by-products, the product will never be entirely free from the latter. These by-products, mostly produced by oxidation of the alcohol, and among which are, primarily, aldehyde and acetic ether, and secondarily, common ether, ethyl formate and oxalate, cyanogen-compounds, etc., occur in larger quantities when following the process of the Netherlands and German Pharmacopœias, where the alcohol itself serves as a means of reducing the nitric acid. Even when prepared according to the Codex medicamentarius (Pharm. Gall.), the spirit contains a series of these by-products, among which are also found some less volatile ones, as glyoxal, glyoxylic acid, oxalic, malic, saccharic acids, etc. A difference in mode of preparation, however, not only alters the kind and quantity of by-products, but also the percentage of ethyl nitrite. Even when following one and the same process, a slight alteration in the modus operandi may essentially alter the qualitative composition and the percentage of ether. From this cause, as well as from the readiness with which ethyl nitrite changes by age, particularly in consequence of the considerable percentage of water in the spirit, or of exposure to light in only partly filled or not securely stoppered vessels, it will be understood how different samples of the spirit can show such different properties, particularly in the percentage of the ether, which is occasionally only present in traces, and sometimes even entirely absent.

It is to be regretted that not every pharmacopœia demands the spirit to have a definite composition and a constant percentage of ethyl nitrite.

The Netherlands and German Pharmacopœia mention no such requirements. It is true both of them mention a definite specific gravity; but this is of little account so far as the percentage of ether is concerned, since both water and ethyl nitrite alter the specific gravity of alcohol in the same direction, namely, by increasing it. Even a greater or lesser amount of oxidation products, as aldehyde, is ignored by both pharmacopœias, nor do they mention any method by which the presence of ethyl nitrite could be detected.

More detailed and exact in the description and properties are the British and United States Pharmacopœias. The latter requires that the spirit should contain five per cent "of its peculiar ether," but gives no method for assaying it. On the other hand, the British Pharmacopœia says: "If it be agitated with twice its volume of saturated solution of chloride of calcium in a closed tube, two per cent of its original volume will separate in the form of an ethereal liquid,† and rise to the surface of the mixture.

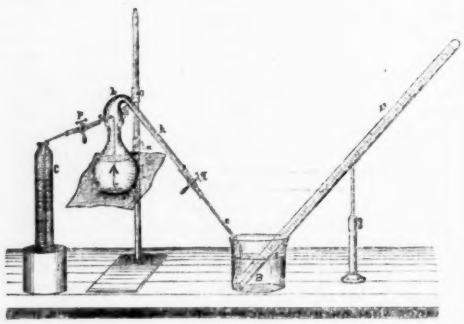
It is clear that this test can only be applied to a spirit

* Abstract of a pamphlet, entitled "*Over Spiritus Ætheris Nitrosi*," communicated by the author.

† A portion of it remains in the chloride of calcium solution. In Parrish's *Treatise of Pharmacy* (1874), I found four per cent; Tanret (*Jahresber. f. Pharmacog.*, 1871), Smith (*Commentary on the British Pharm.*), and others have eight per cent, from which it appears that the preparation as official in England should contain ten per cent of the ether.

prepared according to the British Pharmacopœia, and cannot be used as a method of testing such as are prepared according to other processes, f. i., those of the Netherlands or German Pharmacopœias. In no case can the percentage of absolute ethyl nitrite be determined from the amount of the ether separated by calcium chloride, because the latter separates aldehyde, acetic ether, ether, etc., likewise. Besides, a preparation spoiled by age may be so manipulated by the addition of acetic or ordinary ether that it may respond to the above test without containing the required percentage of the true ether.

The different samples of spirit of nitrous ether, which have been examined in great number here, generally separate *nothing* when shaken with two volumes of a concentrated solution of calcium chloride. A few times from two to five per cent was separated, and once twelve per cent, which latter should correspond to twenty per cent of ethyl nitrite. These differences induced me to examine whether the layer separated by calcium chloride should always be regarded as ethyl nitrite. But the methods which, so far as I know, exist for the assay of ethyl nitrite in spiritus ætheris nitrosi all depend upon its decomposition [saponification] with potassa, and the assay of the resulting potassium nitrite,* seem to me to yield unsatisfactory results, particularly when much of the abovementioned by-products are present. I endeavored, therefore, to find a process in which these by-products would not seriously interfere, and I believe that I have succeeded in finding one, as will be seen from the following description and analytical data.



In general, my method agrees with those proposed by Schloesing, Schulze, Wulfers, Reichardt, Tiemann, and others for the assay of nitric acid in well-water, etc. It depends on the determination of the volume of nitric oxide gas (NO), which is produced by decomposing ethyl nitrite by a ferrous salt, and is driven over and collected by distillation in an atmosphere free of oxygen.

The accompanying figure shows the apparatus used by me for my analysis. *A* is a flask of about one hundred and fifty cubic centimetres capacity. Through its neck passes a narrow (1 to 1.5 millimetres in bore) but thick-walled glass tube, of which the leg inside the flask reaches nearly to the bottom of the latter, and is there curved over in nearly a right angle.†

The leg *c* is about three centimetres long, is joined by means of a short rubber tube, tied with cord, with a thin tube *b* reaching to the bottom of the measuring cylinder *C*. Also the tube *e*, which is connected in a similar way with *h*, by means of a stout rubber tube, likewise tied with cord, of narrow diameter, and curved at its lower end.

The other parts of the apparatus need no description. The beaker *B* and the measuring tube *D* are filled with soda solution of about 1.1 to 1.15 spec. grav. Instead of freeing the soda solution from oxygen by boiling, as is directed by Tiemann, I mixed it with a little solution of ferrous sulphate, in a closed flask, and poured the solution off after the ferric hydrate had settled.

Finally, there is required for the analysis a solution of a ferrous salt, acidulated with a little sulphuric acid, containing from 250 to 300 *gm.* of crystallized ferrous sulphate or 350 *gm.* of Mohr's salt. For shortness' sake, this solution will be indicated, in the following, by the letters *F. S.* Ferrous chloride and hydrochloric acid, which are preferable in the analysis of nitrates, are unsuited here, among other reasons, to prevent the formation of ethyl chloride, which would be produced by them when sweet spirit of nitre is distilled in their presence.

Before the tube *e* is dipped into the soda, the clamps *p* and *q* are to be opened and some of the F. S. (ferrous solution) contained in a beaker, which is put in place of the measuring cylinder shown in the cut, is made to enter the flask *A*. This may be easily effected by suction at the tube *e*, or the clamp *p* may be opened, and that at *q* be closed, and the flask be warmed until enough air has been expelled, when the F. S. will be sucked up into the flask on withdrawing the flame. After the flask has been about half-filled with the F. S., *p* is closed, while the tube *c d* is still filled with liquid, and *q* is opened. The flask is now heated until the contents are at a brisk boil, when the end of the tube *e* is dipped into the soda solution and the boiling continued until no more bubbles of gas escape. As soon as this is the case, *p* is opened, and *q* is closed. This causes the soda solution to rise in the tube *e* up to the pinchcock, and, at the same time, the liquid still contained in *c d* is driven back into the beaker. During this last-named proceeding, the heat is moderated and regulated by the occasional withdrawal of the flame, so that the liquid recedes evenly and completely. About five to ten cubic centimetres always remain in the flask, because the end of the tube does not reach completely to the bottom.

Finally steam is given off; the lamp is then to be withdrawn, and the clamp *p* closed, whereupon the liquid is drawn up, from the beaker, into the tube *d* up to the clamp. The apparatus is now ready for a series of analyses. These are executed as follows:

While the apparatus is deprived of air, 15 *cc.* of F. S. are transferred to a narrow measuring cylinder (*C*) holding about 25.5 *cc.* and graduated to 25 *cc.* Next, 5 *cc.* of dilute sulphuric acid are added, and, finally, 5 *cc.* of the sweet spirit of nitre to be assayed.*

The cylinder, which is now almost full, is well closed, shaken a few times, and then allowed to stand for about five minutes. About 10 to 15 *cc.* of F. S. is now allowed to pass into the flask, by opening the clamp *p*, and afterwards the mixture in the measuring cylinder, taking care to stop the flow when the level of the liquid approaches the bottom to prevent air from entering the flask. To the remnant a little F. S. is added, and nearly the whole of it again allowed to pass into the flask. This manipulation is repeated, finally substituting water for F. S., until the contents of the tube *c d* are filled with colorless water. The flask then contains about 70 *cc.* of liquid.

After the measuring tube, filled with soda solution, has been immersed in the beaker *B*, the flask is heated, and, as soon as the rubber tube above the clamp *q* begins to bulge a little, *q* is slightly opened, taking care to im-

* In *Hoffmann's Manual of Chemical Analysis* a method is described, which consists in decomposing with potassa, diluting with water, and titrating the potassium nitrite, after acidulating with sulphuric acid, by means of solution of potassium permanganate of known strength, until this is no longer rendered colorless.

Rosenbladt recently published (*Zeitschr. f. anal. Chem.*, xvii., Heft 3) a method in which the spirit is saponified by alcoholic potassa in a closed tube, the alcohol driven off afterwards by evaporation, and the residue heated with a concentrated solution of chloride of ammonium in an apparatus filled with carbonic acid gas. From the volume of nitrogen given off, the quantity of ethyl nitrite is determined.

† As I had no flask of sufficiently fusible glass I did not succeed in fusing the upper part *a b* to the flask, although the cut shows the latter to be one piece. I joined both portions with a thick rubber ring tied with twine.

* If the spirit contains very much ether, take 17 *cc.* of F. S. and 3 *cc.* of the spirit; if it contains very little, take 10 *cc.* of F. S. and 10 *cc.* of the ether. The quantity of NO gas which is given off should be so adjusted that 10 to 30 *cc.* of the measuring tube are still filled with soda solution.

mediately close it again if the soda solution should show inclination to ascend the tube further. This is to be repeated until the liquid is completely depressed, when the clamp *q* may be entirely opened. The developed nitric oxide (NO) gas is collected in the measuring cylinder, and the boiling is continued as long as gas-bubbles are given off; about five minutes' boiling is sufficient. After the evolution of gas ceases, *p* is opened and *q* closed. The contents of the flask then pass back into a beaker, and the apparatus is again ready for a fresh assay. Every analysis consumes about ten to fifteen minutes.

The collected gas is now to be treated as follows. By means of a capsule placed under the orifice, the measuring cylinder is transferred to a tall cylinder filled with cold water. The tube should be somewhat inclined so that the soda solution may easily run out of the tube and be displaced by water, without mixing with it. The tube is now to be closed with the finger, and by inclining it, the inner wall will be wetted by the water, so as to wash down any adhering soda solution. The tube is then entirely immersed in water. After the lapse of an hour, it is carefully lifted up until the water outside and inside of the tube occupies the same level, and the volume of gas then read off. The temperature of the water and the barometric pressure having been taken, the quantity of ethyl nitrite is calculated by aid of the following formula:

$$\frac{V}{S \times a} \cdot \frac{H-e}{273+t} \cdot 0.1207 = \text{per cent of ethyl nitrite.}$$

(*V* represents the number of cubic centimeters of gas read off, *H* the barometric pressure in millimeters, *e* the tension of aqueous vapor at the observed temperature, *S* the specific gravity of the sweet spirit of nitre, *a* the number of cubic centimeters of the spirit used for assay, and *t* the observed temperature.)

For the purpose of controlling the correctness of this method, the following tests were made. The suitableness of the apparatus was first ascertained by distilling a weighed quantity of pure potassium nitrate, dissolved in a little water, with a saturated solution of ferrous chloride and hydrochloric acid. After the mixture of potassium nitrate and ferrous chloride had been sucked up, hydrochloric acid was used, in place of water, to wash the last remnants up. The following are the results:

Potassium Nitrate Used.	Yielded Nitric Oxide.	At Temperature.	Barom. Pressure.	Potassium Nitrate Found.
0.060	13.3 *cc.*	7° C.	768 *mm.*	0.0588
0.120	26.4 "	9° C.	768 "	0.1159
0.120	26.55 "	9° C.	768 "	0.1166
0.1483	34.0 "	11.5° C.	761 "	0.1459

On comparing these results with those obtained by Eder,* who used Tiemann's apparatus,† it will be found that they entirely agree with them. The apparatus employed by me, however, has two advantages over that of Tiemann, namely—1. By avoiding the use of a doubly-perforated rubber-stopper, there is greater assurance of the complete closure of the apparatus, and, therefore, a greater certainty of the correctness of every analysis. 2. A much smaller amount of time is required, since the apparatus is immediately again ready for a fresh analysis. It is, therefore, also much to be recommended for the execution of a series of *nitric acid* determinations.‡

To ascertain the influence exercised by the above-mentioned substances, *i. e.*, alcohol and its oxidation products upon sweet spirit of nitre, nitric oxide gas, developed by heating potassium nitrite with ferrous sulphate, was passed into a solution of ferrous sulphate. Three separate portions of 10 *cc.* of this solution, always freshly prepared, were distilled—the first by itself, the second with alcohol, and the third with a mixture of alcohol and aldehyde. The latter was obtained by distilling alcohol with potassium bichromate and sulphuric acid. The distillate, after being neutralized, is rectified and mixed with a little alcohol. The resulting liquid contained, besides other oxidation products, so much aldehyde that, after diluting with twenty times the volume of alcohol, a stronger reaction for aldehyde was obtained by heating with potassa than is found in strongly decomposed spirit of nitrous ether. The following figures were obtained:

Without Alcohol or Aldehyde Mixture.	With 10 *cc.* of Alcohol of 90%.
I. 24.4 *cc.* at 6° C. and 767 *mm.* 24.6 *cc.* " " " " " "	24.7 *cc.* at 6° C. and 767 *mm.* 24.2 *cc.* " " " " " "
II. 18.6 *cc.* at 6° C. and 767 *mm.*	18.8 *cc.* at 7.5° C. and 767 *mm.*

Without Alcohol or Aldehyde Mixture.	With 10 *cc.* of Alcohol and ½ *cc.* of Aldehyde Mixture.
III. 22.6 *cc.* at 7° C. and 756 *mm.* 22.0 *cc.* " " " " " "	22.0 *cc.* at 7° C. and 766 *mm.* 22.2 *cc.* " " " " " "
IV. 31.2 *cc.* at 8° C. and 768 *mm.*	30.7 *cc.* at 8° C. and 769 *mm.*

These figures show that alcohol and aldehyde have but little influence upon the eliminated nitric oxide. I now prepared a small quantity of ethyl nitrite in order to ascertain whether the reaction took place quantitatively according to the following scheme:

$$\underset{\text{ethyl nitrite}}{2C_2H_5.NO_2} + \underset{\substack{\text{ferrous}\\\text{sulphate}}}{2FeSO_4} + \underset{\substack{\text{sulphu-}\\\text{ric acid}}}{H_2SO_4} = \underset{\substack{\text{ferric sul-}\\\text{phate}}}{Fe_2(SO_4)_3} + \underset{\text{alcohol}}{2C_2H_5.OH} + \underset{\substack{\text{nitric}\\\text{oxide}}}{2NO.}$$

The ethyl nitrite was obtained by distilling a mixture of alcohol, sulphuric and nitric acids with copper. The mixture was heated to 71° to 75° C.; the vapors passed first through an empty flask, were next washed with a solution of calcium chloride, and afterwards condensed in a Liebig's condenser. The distillate was caught in a receiver cooled with ice, and afterwards three times shaken with about five times its volume of water. The separated ether having been allowed to stand a few days in contact with unslaked lime, it was then distilled in a fractional-distillation apparatus with Linnemann's tube. The portion passing over at 19° C. was again shaken with ten volumes of water, the separated ether again dried over lime, and once more fractionated. This gave a product boiling at 18° C. and 768 *mm.*, which was used for the following assays.

I. 2.4695 *gm.* were dissolved in 90% alcohol, to measure 100 *cc.* 5 *cc.* of this solution, corresponding to 0.12347 *gm.* of the pure ether ($C_2H_5.NO_2$), yielded:

a) 37.75 *cc.* NO, at 15° C. and 762 *mm.*
b) 37.68 *cc.* NO, " " " " "

corresponding to 0.11843 *gm.* of the ether, thus showing a loss of 0.00504 *gm.* At one time the gas was collected over mercury. After allowing ferrous chloride to pass up through it, there remained unabsorbed, at 10° C. and 762 *mm.*, 0.45 *cc.*

II. 1.2365 *gm.* were dissolved in 90% alcohol, to measure 100 *cc.* 5 *cc.* of this solution, corresponding to 0.061575 *gm.* of the pure ether, yielded:

a) 19.2 *cc.* NO, at 13 C.° and 759 *mm.*
b) 18.95 *cc.* " " " " "
c) Mixed with 1 *cc.* of aldehyde mixture, 19 *cc.* NO, at 13° C. and 759 *mm.*

} = 0.05993 *gm.* of the ether, showing loss of only 0.0017 *gm.*

III. 5.993 *gm.* were diluted with 90 per cent alcohol to 250 *cc.*, portions of 10 *cc.* each, of this solution, were analyzed according to Hoffmann's and Rosenbladt's method, and one portion of 3 *cc.* was analyzed according to my own method (the results are calculated for 10 *cc.* to permit ready comparison with the others). Here are the figures:

* *Zeitschr. f. anal. Chem.*, XVI., 300.
† W. KUBEL, *Anleitung zur Untersuchung von Wasser.* Zweite Aufl. v. Tiemann.
‡ To assay the nitric acid in cuprum aluminatum, 0.25 *gm.* are dissolved in a few *cc.* of water, and distilled with a concentrated solution of ferrous chloride or of Mohr's salt (ammonio-ferrous sulphate) in hydrochloric acid.

Method.		Amount of Ether taken.	Temperature C°.	Pressure *mm.*	Consumed Permanganate.*	Yielded Gas in *cc.*	Amount of Ether found.	Loss.
Hoffmann's	1	0.23971	—	—	25.4 *cc.*	——	0.204	0.0357
	2	0.23971	—	—	21.7 *cc.*	——	0.175	0.0647
Rosenbladt's	3	0.23971	8°	752	——	58.3 N_2	0.1888	0.0509
	4	0.23971	8°	752	——	57.8 N_2	0.187	0.0527
	5	0.23971	9°	752	——	49.8 N_2	0.161	0.0787
	6	0.23971	10°	761	——	68.8 N_2	0.211	0.0287
Eykman's ..	7	0.23971	6°	764	——	21.55 NO	0.2372	0.0025
	8	0.23971	6°	764	——	21.9 NO		

* 1 *cc.* of permanganate solution corresponds to 0.008952 *gm.* of pure ethyl nitrite.

The last series of assays was repeated, with the addition of 25 per cent of adehyde mixture when using my own method, and only 10 per cent with the others. The results were:

a. Hoffmann's Method.

10 *cc.* of the alcoholic solution and 1 *cc.* of the aldehyde mixture consumed 55 *cc.* of the permanganate, and still the latter lost its color.

b. Rosenbladt's Method.

The same mixture yielded, at 10° C. and 763 *mm.* pressure the following quantities of nitrogen gas:

		Pure Ether.	*Loss.*
a.	40.8 *cc.* correspond to	0.1312.	0.1085.
b.	39.3 " " "	0.1260.	0.1137.
c.	21.8 " " "	0.0700.	0.1697.
d.	24.2 " " "	0.0778.	0.1619.

c. Eykman's Method.

A mixture in the same proportion at 8° C. and 765 *mm.*, yielded

		Pure Ether.	*Loss.*
a.	21.4 *cc.* correspond to	0.2331.	0.0066.
b.	21.7 " " "	0.2331.	

Calculated per 100 *cc.* of the solution, or 2.3971 *gm.* of the pure ether, the loss incurred by the three methods is, therefore, as follows:

	Without Aldehyde.	With Aldehyde.
Hoffmann.....	15–27 per cent.	??
Rosenbladt.....	12–32 "	45–70 per cent.
Eykman	1.5–4 "	2.5 "

From these results I am justified in believing that neither Hoffmann's nor Rosenbladt's methods are useful processes on account of the interference of the oxidation products of alcohol.

I append a selection of analyses of spirit of nitrous ether, taken from a number executed by my process.

	Prepared according to Pharmacop.	Spec. Grav.	When shaken with [a] Vols. Sol. of $CaCl_2$ there is separated.	Result of Analysis upon 5 *cc.*	Per Cent of Pure Ether.
1.	Netherl. (fresh)...	0.845	nothing.	20.2 *cc.* NO at 8° and 769 *mm.*	1.56
2.	" " ...	0.844	"	26.4 " " 9° " 769 "	2.04
3.	" " ...	0.851	"	32.0 " " 10° " 769 "	2.44
4.	" (old)....	0.856	"	4.9 " " 8° " 769 "	0.37
5.	U. S. (fresh)...	0.837	—	41.2 " " 8° " 769 "	3.22
6.	" " ...	0.838	nothing.	24.4 " " 6.5° " 769 "	1.92
				24.6 " " 6.5° " 769 "	
7.	" (old)....	0.842	"	17.6 " " 8° " 769 "	1.37
8.	Brit. (fresh)...	0.845	2% = 10% ether.	38.1 " " 6° " 769 "	2.94
9.	?	0.855	4% = 12% "	44.9 " " 9° " 765 "	3.4
10.	?	0.856	12% = 20% "	48.2 " " 6° " 771 "	6.2

It also appears that the ether which is separated from the spirit by shaking with two volumes of a saturated solution of chloride of calcium, consists only *in part* of ethyl nitrite. From about 50 *cc.* of the latter separated by calcium chloride, I succeeded in extracting a few *cc.* of pure acetic ether and a little ether. The liquid had not entirely distilled over when it had reached the boiling point of alcohol; the largest part distilled at above 25° C., and only a few *cc.* could be collected at a temperature of 18° C.

TOKIO, Sijakujio; Jan. 19th. 1882.

Improved Mode of Preparing Violet Syrup.

BY C. BERNBECK.

ONE HUNDRED grams of the flowers of the violet are macerated with 50 grams of alcohol. The mixture is digested for six to eight hours, after which it is pressed, and the liquid made up to 100 grams with water. It is then filtered, and mixed with 9 parts of syrup of specific gravity of 1.36.—*Chem. Centralbl.*, 1881, 448.

Peroxide of Hydrogen.

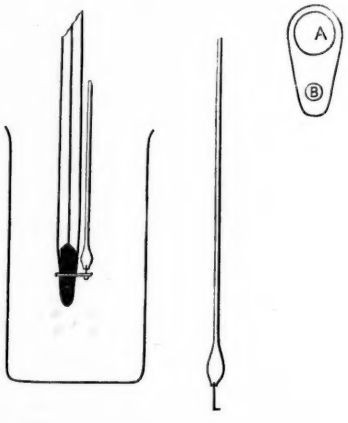
MORITZ TRAUBE announces that peroxide of hydrogen is immediately and copiously produced by shaking water and oxygen or air with palladium hydride (*Ber. d. Deutsch. Chem. Ges.*, 1882, 222). Possibly this method may be utilized for preparing it for medicinal and cosmetic uses. Hydride of palladium is readily prepared, either by passing hydrogen over metallic palladium heated to redness, or by bringing the metal in contact with nascent hydrogen.

A New Apparatus for the Determination of Melting Points.

BY C. F. CROSS AND E. J. BEVAN.

As it is well known that the behavior of liquids in capillary tubes is controlled by laws different from those which regulate them under ordinary conditions, it is obvious that the usual method of determining melting points is consequently open to at least one serious objection; and, as the ascertaining of the exact melting point of a substance thereby is a matter of some little difficulty and trouble, a method which is not open to such objections must be regarded as a desideratum. We believe that the following method will recommend itself on this account.

The essential parts of the apparatus consist of a small platform, Fig. 1 (actual size), made of very thin sheet-iron (the thin sheets used for ferrotypes are suitable) or silver (platinized), having an opening, A, cut for the purpose of receiving the bulb of a thermometer, and a small indentation, B, Fig. 1, about 1.5 millimeters deep and 2 millimeters in diameter, and a glass float (Fig. 2) having a thin piece of platinum wire sealed into one end, flattened, and bent into the shape of the letter L, as shown.



To make an observation, a very small quantity of the substance is melted in the indentation (B, Fig. 1) of the platform, and, while it is still liquid, the platinum wire of the float is placed in it, and allowed to become fixed by the solidification of the substance.

Thus arranged, a thermometer is placed in the opening A, and the whole disposed as in Fig. 3, in a small beaker containing mercury or other liquid.

The mercury is now gently heated, the thermometer being carefully watched. As soon as the melting point is reached, the float being liberated, rises instantly to the top of the mercury.

The special advantages of this method, in addition to those already alluded to, are these: (1) The substance being entirely surrounded by mercury, and the metallic platform is certain to be of exactly the same temperature as the thermometer; (2) on account of the perfect conductivity of the mercury, no stirring is necessary, and (3) as the sudden rise of the float at the melting point forces itself upon the attention of the operator, his observations can be entirely confined to the thermometer.

The following determinations may be cited as showing the correctness of the method and its applicability to a very wide range of temperature.

The numbers have a purely relative value, as the thermometer was not corrected in any way, nor were the substances specially purified.

Purified paraffin.	Resorcinol.	Mercuric chloride.	Sodium nitrate.
52.7°	105.0°	257.0°	286.0°
52.4	105.1	259.0	287.0
52.4	105.0	259.0	287.0
52.6	105.5	——	288.0
52.7	104.5	——	286.0
52.3	105.0	——	——
Mean 52.5	105.0	258.3	286.8

In order to prove the correctness of the method, the melting point of the paraffin used in the above determinations was observed by the inverse method of immersion of the thermometer in a half melted mass, as in the determination of the melting point of ice. In three experiments, the values 52.5, 52.4, and 52.5 were obtained.

Notes.

(*a*) In order to prove that no stirring was necessary, the following experiment was made: A test-tube three inches in diameter and eight inches long was filled with mercury and fitted with two thermometers, the bulb of one being at the top, and that of the other at the bottom of the mercury.

On gently heating, it was found that both thermometers indicated exactly the same temperature. This being so, if very accurate results were required, the *thermometer* could be immersed in the mercury to any extent, and thus the error due to the exposure of the stem could be eliminated.

(*b*) Since writing the above, we have seen a notice of a melting-point apparatus described by C. H. Wolff (*Arch. Pharm.* [3], 6, 534). His arrangement, which is a modification of one proposed by G. Löwe, consists in coating a thin platinum wire with the substance whose melting point is to be observed, and making it part of an electrical circuit, in which a bell is placed. The connection between the two is made by a mercury bath containing a thermometer.

If now the bath be heated, the substance melts, and the platinum wire becomes electrically connected with the bell, and thus the melting point is announced.—*Journ. of the Chem. Soc.*, 1882, III.

The Physiological Action of Commercial Aconitines.

THE physiological action of different commercial aconitines forms the subject of a paper by Prof. P. C. Plugge, of Groningen (Netherlands), published in Virchow's *Archiv*, vol. lxxxvii., p. 410,* from which we abstract the following:

During the experiments conducted by Prof. Plugge, in conjunction with Prof. Huisinga, to ascertain the fatal dose of certain aconitines submitted to them (in consequence of the poisoning case at Winschoten, see NEW REM., 1880, p. 293), Prof. Plugge thought he could recognize qualitative differences alongside of the quantitative effects; but the object of the investigation being mainly the discovery of the latter, and the quantities of the materials at disposal being limited, no special attention could be paid to the former.

For the purpose of the present investigation, the following seven different kinds of aconitine were employed:

1. *Nitrate of aconitine*, from Petit—in form of hard white crystals.

2. *Nitrate of aconitine*, from Morson—a yellowish-brown powder. This was a "pseudaconitine" [that is the alkaloid extracted from the Himalaya aconite (*Aconitum ferox*, Wallich).]†

3. *Nitrate of aconitine*, from Hottot—a white powder.

4. *Nitrate of aconitine*, from Hopkins and Williams, a transparent gum-like mass of greenish-brown color (perhaps a pseudaconitine?).

* Communicated by the author.

† If the term pseudaconitine, in the original, is used in the sense in which it is now generally understood. The words in brackets are added by us.—ED. N. R.

5. *Nitrate of aconitine*, from Merck—a yellowish light-brown powder.

6. *Sulphate of aconitine*—a grayish-white powder.

7. *Nitrate of aconitine*, from Trommsdorff—a grayish-white gum-like mass. (This was obtained from Friedländer, of Berlin, but was made by Trommsdorff.)

The above-named kinds of aconitine were used in aqueous, one-half or one per cent solution upon frogs; and while it was not the special object of the author to determine the fatal dose of each sample, yet his results justified him to classify the samples, according to their comparative efficacy, in the succession given above. The most active is the French, of Petit, which is even stronger than Morson's, and the weakest is Trommsdorff's.

Want of space and the purely physiological interest attached to the experiments do not justify us in presenting the details of the experiments contained in the author's paper; but the results may be summed up as follows:

1. Though the different kinds of aconitine exhibit a difference in the quantity of effect, no such difference could be detected in the quality of the same, all of them (even pseudaconitine) affecting the heart, respiration, motor nerves, etc., in precisely the same manner.

2. Aconitine and pseudaconitine paralyze the peripheric, intramuscular terminations of the motor nerves, resembling, in this respect, curare.

3. The nerve trunk is not paralyzed by these alkaloids.

4. The sensory nerves are not at all, or, at most, very faintly, paralyzed.

5. Where general paralysis apparently supervenes, this appears to be only due to the effect upon the peripheric nerve-ends.

6. The muscles retain their excitability, even after doses of aconitine which are five to ten times larger than those which paralyzed the nerve-ends.

The following observations are also recorded as having been incidentally noticed:

7. The pupil is frequently dilated, but not always.

8. Respiration soon becomes laborious, and ceases entirely after a few minutes. The phenomenon is quite constant.

9. A slimy secretion of the skin (in frogs) was frequently noticed. Its quantity was different, according to the kind of aconitine employed.

10. Yawning and retching occur almost always (both in *Rana esculenta* and in *Rana temporaria*).

11. The blood of the poisoned animal generally has a dark-violet color, so that the full veins appear black. Only Schuchart's and Trommsdorff's preparations produce a much less intense change of color.

12. The heart generally stops in diastole, densely filled with dark violet-red blood; the ventricles beat more strongly than the auricles. The poisoned but still pulsating heart cannot be made motionless either by excitement of the pneumogastric nerve or by that of the sinus. Just after ceasing to beat, it may be brought in motion again by galvanic excitement.

Poisoning by Aconitine.*

In April, 1880, a case of death by poisoning occurred at Winschoten,† in Holland, which was supposed to have been due to an error in dispensing a mixture containing nitrate of aconitine. In connection with the judicial investigation, the authorities submitted to Profs. Plugge and Huysinga, of Groningen, (1) a mixture, (2) three samples of nitrate of aconitine, and (3) the residue from the evaporation of benzol that has been shaken with the vomit and the contents of the stomach and intestines of the deceased, with a request that they would report upon their relatively poisonous properties.

The three samples of nitrate of aconitine were labelled respectively (*b*) aconitin. nitric., from Mastenbroeks & Gallenkamp (the firm by whom the mixture was dispensed); (*c*) aconitin. nitric., from E. Merck, of Darmstadt, and (*d*), aconitin. nitric., from Friedländer, of Berlin. [The last-named afterwards turned out to be a product of the factory of Trommsdorf, in Erfurt.]

The first examined was the nitrate of aconitine labelled (*b*), since it was the kind used in dispensing the mixture, the prescription for which was as follows:

℞ Aconitini nitrici 0.2
Tinct. chenopodii ambrosioidis..... 100.0
D. S. Hourly; 20–40–60 drops.

It appears that the physician intended Friedländer's nitrate of aconitine, but as he did not say so, the dispenser used a preparation he had in stock, and which he had originally obtained from Petit, of Paris. It consisted of hard, white crystals, which were difficultly soluble in cold water. An 0.2-per-cent solution was prepared for subcutaneous injection in experiments upon frogs, rabbits, dogs, and pigeons.

The sample of Merck's nitrate of aconitine (*c*) was a yellow-brown powder, which dissolved freely in water. As a weaker action was anticipated from this preparation, a one-per-cent solution was used.

The sample of Friedländer's nitrate of aconitine was a hard, grayish-white agglutinated gummy mass, very soluble in water. Of this, a one-per-cent solution was used.

The physiological phenomena following the injection of these different solutions are minutely described in the original paper. The difference between the action of Petit's preparation and that of Merck's appeared to be quantitative only, no qualitative difference being observed. Both were powerful heart-poisons, death resulting from stoppage of the heart's action. Friedländer's preparation apparently differed in not affecting the heart so much, in proportion to the development of the other aconite symptoms, such as a chewing motion of the mouth, flow of saliva, difficulty of breathing, dyspnœa, etc.

The relative activity of the preparation is shown in the following tables:

(*b*) *Nitras Aconitini, from Petit, Paris.*

	Dose.			Effect.
Frogs.	0.4 mg. = per kilo	16	mg.	Death in 60 minutes
Rabbits.	0.8 mg. = "	0.5 to 0.6	mg.	Death in 30 minutes
Dogs.	1.6 mg. = "	0.21	mg	Death in 20 minutes
"	0.45 mg. = "	0.10	mg	Death in 140 min.
"	0.50 mg. = "	0.054	mg	Recovered.
"	0.66 mg. = "	0.075	mg.	Recovered.
Pigeons	0.07 mg. = "	0.22	mg.	Death in 21 minutes

(*c*) *Nitras Aconitini, from Merck, Darmstadt.*

	Dose.			Effect.
Frogs.	0.4 mg. = per kilo	16	mg.	Recovered.
"	1.0 mg. = "	40	mg.	Death in 120–360 hrs
"	2.0 mg. = "	80	mg.	Death in 75–130 hrs.
"	4.0 mg. = "	160	mg.	Death in 52 hours.
Rabbits.	3.5 mg. = "	2	mg	Death in 75 hours.
"	10.0 mg. = "	6.52	mg	Death in 5 hours.
Dogs.	10.0 mg. = "	1.65	mg.	Death in 15 hours.
Pigeons.	0.4 mg. = "	1.65	mg.	Recovered.

(*d*) *Nitras Aconitini, from Friedländer, Berlin (Trommsdorf, Erfurt).*

	Dose.			Effect.
Frogs.	4 mg. = per kilo	160	mg.	Recovery.
"	10 mg. = "	400	mg	Death after 60 hrs.
"	20 mg. = "	800	mg.	Death after 60 hrs.
"	40 mg. = "	1,600	mg.	Death after 60 hrs.
Rabbits.	6 mg = "	4.11	mg.	Recovered.
"	24 mg. = "	10	mg.	Recovered.
"	50 mg. = "	85.5	mg.	Recovered.
"	28 mg. = "	6	mg.	Recovered.
Pigeons.	10 mg. = "	33.4	mg	Recovered.

The quantity of this preparation at the disposal of the experimenters did not allow of an estimate being made of a lethal dose for a warm-blooded animal, but when admin-

* By P. C. Plugge. Abstract of a paper in *Archiv der Pharm.*, January. After *Pharm. Journ.*, Feb. 15th. Also directly communicated by the author.—Ed. N. R.

† See New Rem., 1880, 296.

istered to rabbits, in the proportion of 85.5 mg. per kilo of the animal's weight, it produced tolerably strong symptoms of poisoning.

From the above figures, the following conclusions are drawn :

(1) Petit's nitrate of aconitine has a poisonous action at least eight times stronger than that of Merck's, and one hundred and seventy times stronger than that of Friedländer's.

(2) Merck's nitrate of aconitine has a poisonous action at least twenty to thirty times stronger than that of Friedländer's.

It also appears from the foregoing that the preparations known as "German Aconitine," are not always of the same strength, there being a much greater difference between the two German preparations examined than between the more powerful of the two and the French preparation.

In conclusion, the author emphasizes the necessity—seeing the great possibility of variation in preparations sent to the market—that physicians should exercise the greatest care in prescribing aconitine and its salts, as the dispensing of a different preparation from that intended by the prescriber may lead to the administration of a fatal dose, as in the case under investigation, where, instead of Friedländer's preparation, which was intended but not specified by the prescriber, that of Petit, which was one hundred and seventy times stronger, was used. The author also recommends that the official maximum dose in the Dutch Pharmacopœia of four milligrams per single dose, or thirty-two milligrams daily, should be struck out, as in this case it proved fatal.

Comparative experiments with the mixture confirmed the statement that Petit's preparation had been used in dispensing the mixture. Only negative results were obtained with the residue from the vomit, etc.

The Yield of Aconitine from Aconite Root according to different Processes.

MR. SCHNEIDER (*Arch. d. Pharm.*, vol. 219, No. 5), tried different processes to ascertain the comparative yield of alkaloid. The process of the British Pharmacopœia yielded only 0.002 per cent, or 1 part of alkaloid from 50,000 parts of aconite. Morton's process (*Buchner's Commentar z. Ph. Germ.*, 1874) gave 0.127 per cent of a light-yellow electric powder. Hirzel's process yielded 0.0046 per cent (*Vorträge über Pharmacie*, Leipzig). Wittstein's process (*Anleitung zur Darst.*, etc.) gave 0.14 per cent in well-formed, isolated, six-sided tablets. Hottot and Liégois' process (*Dorvault's Officine ;* approaching in its main features that of the U. S. Ph.) yielded 0.296 per cent of crystals. Duquesnel's process (*Jahresbericht d. Pharm.*, 1872) gave 0.339 per cent of well-developed crystals.

The good results of the last-named process are ascribed by the author to the fact that Duquesnel extracts with 90% alcohol, containing one per cent of the tartaric acid, by cold percolation, while all the others use more or less heat, some with and others without sulphuric acid.

Tooth-Wash.

White oak bark, in fine powder	.....	2½ ounces.
Rhatany, "	....	½ ounce.
Sassafras, "	....	1 dram.
Red cinchona, "	....	3 drams.
Cardamom, "	....	30 grains.
Cinnamon, Ceylon, "	....	20 "
Cloves, "	....	30 "
Oil of wintergreen,	.....	1 fl. dram.
" anise	.....	½ "
Alcohol	.....	20 fl. ounces.
Water	.....	12 "

Macerate ten days and filter. Finished product, 1¾ pints.—E. W. RUNYON.*

* *Chemist's Journ.*, page 51.

Selections from the Non-officinal Formulary of the Dutch Society for the Advancement of Pharmacy.*

(Continued from page 112.)

Sal Carsbadense factitium. — Artificial Carlsbad Salt.

	Parts.
Sulphate of sodium, dried and powdered	46
Bicarbonate of sodium, powd	42
Chloride of sodium, "	20
Sulphate of potassium, "	3

Mix and keep in a well-stoppered bottle.

Quiniæ Salicylas. — Salicylate of Quinine.

	Parts.
Hydrochlorate of quinine	15
Salicylate of sodium	6
Distilled water	q. s.

Dissolve the hydrochlorate of quinine in 600 parts of boiling distilled water, and add to it a solution of the salicylate of sodium in twenty parts of distilled water. Collect the precipitate, after cooling, on a filter, wash it until the washings are no longer rendered turbid by nitrate of silver, and dry it with a gentle heat.

The salt may be obtained in crystals by dissolving it in strong alcohol and concentrating.

When crystallized from alcohol, the salt appears in silky needles ; when obtained as a precipitate, it is a white, amorphous powder, soluble in about 900 parts of cold water and in 20 parts of strong alcohol.

The aqueous solution has a fluorescence, which increases very much by adding dilute sulphuric acid. Addition of solution of ferric chloride renders the solution dark-violet.

Sodii Salicylas. — Salicylate of Sodium.

	Parts.
Salicylic acid, dialyzed	33
Bicarbonate of sodium	20
Distilled water.	q. s.

Mix the acid and bicarbonate in a porcelain capsule, with the least possible quantity of distilled water to a thick paste and heat the mixture, on the water-bath, to a temperature not exceeding 60° C. (140° F.). When no more carbonic acid gas escapes, ascertain if the solution has still a slight acid reaction, and, if this is the case, evaporate it to dryness, under constant stirring.

A white powder, crystalline or amorphous, soluble in 0.8 parts of water and in 5 parts of strong alcohol.

Sanguis bovinus siccus. — Dried Ox-blood.

Fresh ox-blood	q. s.

Free it, while still fresh, by beating, from the fibrin, strain and evaporate it, under continuous stirring, on the water-bath to dryness, at a temperature not exceeding 60° C. (140° F.).

Preserve the powder in a well-stoppered bottle.

Sapo guaiacinus. — Guaiac Soap.

	Parts.
Guaiac	2
Potassa	1
Water	q. s.

Rub them together and add enough water, in drops, to produce a mass of a pilular consistence.

It should not be kept in stock.

Sapo Picis liquidæ. — Tar Soap.

	Parts.
Medicinal soap (Castile soap)	24
Carbonate of sodium, dried and powdered	2
Borate of sodium, powdered	1
Tar	8
Water	q. s.

Mix them together to a mass of a pilular consistence and divide it into pieces of suitable size.

* See original title in our January number, page 10.

Sapo Terebinthinæ liquidus. Liquid Turpentine Soap.
[Balsamum vitæ citrinum.]

	Parts.
Carbonate of sodium	3
Medicinal (Castile) soap	4
Oil of turpentine	6
Compound spirit of mastic	6
Compound spirit of juniper	6
Water	60

Heat the carbonate of sodium, soap, oil of turpentine and water for several hours on the water-bath, filter and add the spirits.

Compound Spirit of Mastic (Pharm. Neerl.) is prepared thus:

	Parts.
Mastic	1
Olibanum	1
Myrrh	1
Amber	1
Stronger alcohol	10
Water	12

Distil them together until the distillate has a spec. grav. of 0.873 to 0.878.

Compound Spirit of Juniper (Pharm. Neerl.):

	Parts.
Juniper berries	3
Caraway	1
Fennel	1
Stronger alcohol	14
Water	30

Distil them together until the distillate has a spec. grav. of 0.929 to 0.935.

Liquor Acidi Arsenici. Solution of Arsenic Acid.

	Parts.
Arsenious acid, powdered	4
Hydrochloric acid	1
Nitric acid	9
Distilled water	q. s.

Boil the acids together in a glass flask, until a portion of the liquid, after being neutralized with soda solution, is no longer rendered green by solution of bichromate of potassium.

Evaporate, on the water-bath, in a porcelain capsule, until acid vapors are no longer given off, and the liquid has a syrupy consistence.

Finally, add enough distilled water to obtain 80 parts of product.

The solution contains 5.75 per cent of arsenic anhydride (As_2O_3).

Liquor Ferri Albuminatis.
Solution of Albuminate of Iron.
[Solutio Albuminatis Ferrici.]

	Parts.
Albuminate of iron	1
Hydrochloric acid	0.1
Distilled water, warm	100

Dissolve the albuminate of iron by aid of the acid in the water, and filter the solution, if necessary.

The product contains 0.033 per cent of iron, and should be freshly prepared when wanted for use.

(The formula for Ferri albuminas, see on page 10 of January number.)

Liquor Hydrargyri Albuminatis.
Solution of Albuminate of Mercury.
[Solutio Albuminatis Hydrargyrici.]

	Parts.
White of egg	32
Bichloride of mercury	1
Chloride of sodium	4
Distilled water	q. s.

Mix the white of egg thoroughly with 45 parts of distilled water; filter the mixture, and precipitate it by enough of a solution of the bichloride of mercury in 19 parts of distilled water, until a few drops of the liquid, when mixed with solution of carbonate of sodium, begins to assume a red color.

Then add a solution of the chloride of sodium in 16 parts of distilled water, or as much thereof as may be required to redissolve the precipitate.

Dilute the mixture with distilled water to 100 parts.

Let it stand a few days, filter it, and preserve it in small, completely closed vials.

Sapo Stibiatus. Antimony Soap.

	Parts.
Sulphide of antimony (Schlippe's salt)	1
Medicinal (Castile) soap	3
Water	3

Dissolve the sulphide of antimony in the water, add the soap and reduce the mass to a pilular consistence, by a gentle heat.

Whenever the mass assumes a red color, on the water-bath, add a little solution of soda.

The soap should have an ash-gray color, and be soluble in water. It should be kept in a well-stoppered bottle.

N. B. Schlippe's Salt is prepared as follows: 75 parts of carbonate of sodium (cryst.) are dissolved in 300 parts of water, heated to boiling and mixed with a milk of 26 parts of lime and 100 parts of water. After half an hour's boiling, 9 parts of sublimed sulphur and 36 parts of levigated sulphide of antimony are added, and the whole boiled until the gray color has disappeared, when the liquid is filtered and crystallized. The salt has the composition: $Na_6Sb_2S_8.18H_2O$. It is a sulphantimonate of sodium.

Liquor (Bromo-) Arsenicalis Clementis.
Clement's Solution of Arsenic and Bromine.
[Solutio Arsenicalis Clementis.]

	Parts.
Arsenious acid	1
Carbonate of potassium	1
Bromine	2
Distilled water	q. s.

Heat the arsenious acid with the carbonate of potassium and 10 parts of distilled water in a flask, until the acid is completely dissolved. When cold, add to it the bromine and enough distilled water to make the product weigh 100 parts.

Liquor Arsenicalis Isnardi. Isnard's Solution of Arsenic.
[Isnard's Water.]

	Parts.
Arsenious acid	1
Distilled water	q. s.

Dissolve the acid in 100 parts of distilled water, and dilute the solution with distilled water to 10,000 (ten thousand) parts.

Liquor Chloroformi cum Morphia.
Solution of Chloroform with Morphine.
[Solutio Chloroformi cum Morphino.]

	Parts.
Morphine (alkaloid)	1
Acetic acid	q. s.
Stronger alcohol	20
Chloroform	80

Dissolve the morphine in just enough acetic acid at a gentle heat. Then add the alcohol and chloroform, and preserve the mixture in a well-stoppered bottle.

Liquor Ammonii Citratis.
Solution of Citrate of Ammonium.

	Parts.
Citric acid	16
Water or ammonia	q. s.
Distilled water	q. s.

Dissolve the citric acid in 40 parts of distilled water; add enough water of ammonia to neutralize the solution (about 40 parts). Filter and dilute with enough distilled water to make the product weigh 100 parts.

The solution contains 20 per cent of citrate of ammonium, and should be freshly prepared when wanted for use.

Tinctura Ferri Iodidi. Tincture of Iodide of Iron.
[Solutio Iodeti Ferrosi Spirituosa.]

	Parts.
Iron, in powder	3
Iodine	8
Distilled water	q. s.
Stronger alcohol	q. s.

Mix the iron and iodine in a glass flask, with 20 parts of distilled water. When the mixture has acquired a bright-green color, filter it, wash the filter with a little strong alcohol, and add enough alcohol to the filtrate to make it weigh 100 parts.

The tincture contains 9.7 per cent of ferrous iodide, and should be freshly prepared when wanted for use.

Tinctura Iodinii Decolorata.
Decolorized Tincture of Iodine.
[Solutio Iodii Decolorata.]

	Parts.
Iodine	10
Hyposulphite of sodium	10
Spirit of ammonia	16
Distilled water	q. s.
Alcohol (stronger)	75

Digest the iodine with the hyphosulphite and ten parts of distilled water in a glass flask until all is dissolved. When cold, add the spirit of ammonia, shake a few minutes, and then add the alcohol. Let the mixture stand in a cool place until it has become colorless; then filter.

A clear, colorless liquid, of a peculiar ammoniacal odor, and a spec. grav. of 0.940 to 0.945.

Liquor Ferri Dialysati. Solution of Dialyzed Iron.
[Dialyzed Iron.]

	Parts.
Solution of chloride of iron (ferric chloride), spec. grav. 1.480–1.484	35
Water of ammonia (0.960)	20
Distilled water.	

Place the solution of chloride of iron in ice for fifteen minutes; then mix it gradually with the water of ammonia, previously cooled by ice. Stir the mixture, and when it has become clear again, pour it into a hog's bladder, previously cleansed by treatment with dilute solution of potassa, and washing with water. Tie the bladder as close to the liquid contents as possible, and suspend it in a cylindrical glass containing five times the volume (of the bladder) of distilled water, so that the surface of the water is about 1 *cm.* above the top of the bladder.

Change the water, first every twelve, afterwards every twenty-four hours, and continue to do this until the water, when acidulated with nitric acid, is no longer rendered turbid by nitrate of silver. Then dilute the liquid in the bladder with distilled water until it has a spec. grav. of 1.046.

The solution contains five per cent of iron, is clear, has a dark-brown color, no odor, and scarcely any taste. It is miscible with strong alcohol, but on addition of an acid or an alkali, it separates a red-brown precipitate.

It should give no reaction either with ferricyanide of potassium or with nitrate of silver.

Liquor Sodii Carbolatis. Solution of Carbolate of Sodium.
[Solutio Phenylatis Natrici.]

	Parts.
Carbolic acid	5
Solution of soda (spec. grav. 1.330)	1
Distilled water	4

Mix them.

A clear liquid of an alkaline reaction, a spec. grav. of 1.060 to 1.065, and miscible with water and alcohol in all proportions.

It should be freshly prepared when wanted for use.

Tinctura Saponis Viridis. Tincture of Green Soap.

	Parts.
Green soap	1
Alcohol	1
Spirit of lavender	1

Dissolve the soap in the alcohol, add the spirit, and filter.

Liquor Phosphori Ætherei.
Ethereal Solution of Phosphorus.
[Solutio Phosphori Ætherea.]

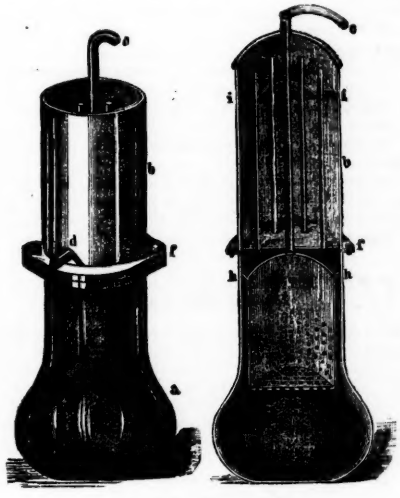
	Parts.
Phosphorus, powdered	1
Ether	200

Pour the ether in a flask provided with a well-fitting stopper; add the phosphorus, close well and macerate, occasionally shaking, for three or four days, or until no more undissolved phosphorus remains. Pour the clear liquid into small vials, which must be completely filled and kept in a cool and dark place.—(On Powdered Phosphorus, see page 112, April number.)

Continuous Extraction Apparatus.

As we know by experience and by correspondence with a number of our readers that there is considerable diversity of opinion regarding the merits of the different forms of continuous extraction apparatus, we describe, in the following, two simple extractors, suitable for all kinds of work.

Figs. 1 and 2 represent an improved form of Thorn's extractor (see NEW REM., 1881, 263), constructed of metal, and intended to be used either for analysis, or, on a large scale, for manufacturing. It consists of the boiler, *a*, within which the extraction-vessel, or percolator, *g*, is suspended on a projecting ledge at *h h*. Sufficient space is left at the sides to permit the vapors of the volatile liquid to ascend. The upper half of the apparatus consists of a



Thorn's Extraction Apparatus.

condenser, traversed by a number of tubes, the central one of which, *c*, is curved at the top, and may be connected with an ordinary condenser, in order to recover the volatile liquid, after the extraction is completed. The other tubes project a short distance above the upper plate of the condenser, but are closed on top. Their lower orifice projects slightly below the bottom of the condenser, and is obliquely cut off to facilitate the dropping of the condensed liquid. When the apparatus is to be used, a piece of linen, or filtering paper, is tied over the perforated part of the extractor, the substance to be extracted is placed in the vessel, and a sufficient quantity of the volatile liquid in the outer boiler.

Doliarina.

DOLIARINA is the name of a new alkaloid extracted from the variety of fig known as *Ficus doliaria*, which is regarded in Brazil as a remedy for a helminthoid parasite.

Administration of Chinoline.

THOSE who are inclined to try the effects of tartrate of chinoline as an agent for reducing temperature will find it to be a white crystalline powder with a tobacco-like odor, having an irritating effect on mucous membranes. It may be given in wafer or in equal parts of syrup and water. Peppermint is said to disguise its taste and it has not been known to cause unpleasant after-effects or cerebral disturbance. The dose of tartrate of chinoline for an adult is about thirty grains.

Some Commercial Features of Chinoline.

IN response to our request, one of the wholesale drug houses of this city has furnished us with the following facts respecting chinoline and its salts, which will interest our readers. "Of late, the demand, chiefly for the tartrate and salicylate, has very much increased, though most of the orders are for small quantities; as yet, we have only imported it in one-ounce bottles, but presume that we will now get it in larger packages.

"So far, we have imported chinoline, pure, at $1.25 to $1.50 ounce; tartrate, at 90c. to $1.25 ounce; salicylate, $1.25 to $1.50 ounce; but the tannate, at $1.00 to $1.15 ounce; sulphate, at $2.25 to $2.50 ounce; muriate, $2.25 to $2.50 ounce; ferro-citrate, 75c. to 85c., according to quantity, are also made, and will soon be in stock. The price, as with all new preparations, we believe to be rather high, and lower prices may be expected if the demand keeps on increasing.

"So far as we know, the only manufacturers are E. Merck, of Darmstadt; E. Schering, of Berlin; and Hoffmann and Schötensack, of Ludwigshafen.

"We also understand that a process for the manufacture of pure chinoline and sulphate of chinoline has been patented in this country by Messrs. Pickhardt and Kuttroff; however, no products of theirs have been placed on the market, and we know nothing about them." [See patent in this number.—ED. N. R.]

Chinoline itself is a liquid, and should be kept in a cool place; its boiling point is from 227° to 232° C. The salts are not hygroscopic, and may be put up in paper packages, but should not be exposed to the light.

A New Method of Embalming Bodies and Preserving Tissues.

DR. VIRODTZEFF recommends the following preparation as an efficient agent in the embalming of bodies and the preservation of tissues: Thymol, 5 parts; alcohol, 45 parts; glycerin, 2.160 parts; water, 1.080 parts.

It is cheap, innocuous, free from unpleasant odor, possesses the property of keeping the body soft, elastic, fresh, and life-like, and does not ruin instruments. Thymol is selected as being superior to other antiseptics, and glycerin is added, both on account of its own preservative qualities, and to retard the evaporation of the fluid. For the preparation of tissues, the same solution is used. If the cadaver be quite lean, or the tissues very delicate, equal parts of water and glycerin (1.620 of each) are combined with the above quantities of thymol and alcohol. To inject a body, half its weight of the fluid is necessary. A properly embalmed cadaver may be preserved indefinitely under ordinary circumstances, gradually shrinking and mummifying without putrefaction. Specimens are either to be injected with or macerated in this fluid. Maceration must not be too prolonged—the appearance of the specimen should act as a guide. The part, after having been thoroughly cleansed in water, and prepared, may then be exposed for months to the air without losing its consistence, form, and color. Permanent specimens may be inclosed in a hermetically-sealed glass vessel containing a little of the same solution. The *Medical Record* says that Dr. Peabody has used this preserving fluid with excellent results in the New York Hospital museum.

Detection of Oleomargarine.*

IN the *Moniteur Scientifique* for April, 1881, is an article on butter analysis, in which are given the processes used at the Municipal Laboratory attached to the Prefecture of Police in Paris, for the detection of foreign fats in butter. This is followed by an account of an areometric method, used for the same purpose and based on the difference of density between butter and the fats with low melting-point extracted from tallow, which are made to resemble genuine butter, and which are known under the commercial name of *Oleomargarine*.

The sale of oleomargarine has become so extensive in this country that a purchaser of butter is never sure whether he is getting true butter or its imitation. In view of this fact, I have thought it useful to give a process, based on the difference of specific gravity between butter and oleomargarine, of such simplicity that it can be easily applied by any person having rudimentary ideas of manipulation.

Processes of this character are those which can be used with greatest efficiency to check adulterations. I have, in previous communications, given such processes for the detection of starch sugar mixed with cane sugar, and for the detection of starch sugar syrup mixed with sugar-house syrups.

Although my concern is principally with the difference of density between butter and oleomargarine, I propose to very briefly call attention to the processes used at the Municipal Laboratory of the Prefecture of Police, as these show important differences in chemical composition between true butter and its adulterant, which confirm the difference in the specific gravity. Such an important character as the specific gravity would not differ to any marked extent without a corresponding diversity in the composition of the two substances.

One process used at the Municipal Laboratory is the following: the sample of butter to be tested is melted, so as to separate water, salt, etc., which are deposited, and a certain amount of scum, which comes to the surface Of the clear melted fat, under the scum, about three or four grams are taken and saponified by one or two grams of potassic hydrate. The fat and potassa should be mixed with 50 *cc.* of alcohol. In about five minutes the saponification is complete, and the cautious addition of water should not produce any turbidity. If any takes place, the operation must be begun anew. The soap formed is afterwards decomposed with weak sulphuric acid, and the insoluble fat acids are collected and weighed. The result of a great number of experiments is that in butter the percentage of fat acids thus obtained is usually 86.5 to 87.5 per cent, and that sometimes it is as high as 88 per cent. In animal fats from tallow the percentage of insoluble fat acids is 95½. The difference $95\frac{1}{2} - 87\frac{1}{2} = 8$ per cent, is attributed to the absence in tallow of volatile and soluble fat acids which exist in butter.

Another process is given in which the result is obtained volumetrically, by estimating the quantity of potassa used in saponifying the fat. One gram of butter requires 225 to 232.4 *cc.* of potassa solution, while one gram of tallow, or other animal fat of the same nature, requires from 195 to 197 grams of the same potassa solution.

Mr. Charles Girard, director of the Municipal Laboratory, considers as adulterated any butter requiring, for saponification, less than 221.5 *cc.* of the potassa solution. In some unfavorable cases this volume may represent nearly 30 per cent of foreign fat.

The method for detecting the difference between butter and oleomargarine by the difference of specific gravity is one proposed by Messrs. Leune and Harburet.

The butter to be tested is first melted so as to separate the pure fat from water, salt, etc. The clear melted fat is placed in a cylinder, heated by the vapor escaping from a water-bath, kept boiling, but no part of the cylinder is to be in the boiling water. I understand that by heating in this way, the temperature of the melted fat remains at

* By P. CASAMAJOR. Read before the American Che i:al Society, September, 1881.

about 93° C. To determine the density of this fat an areometer is placed in it. This areometer is graduated in such a way that, in butter, it will sink to the lowest mark of the scale, while oleomargarine corresponds to the highest point in the graduation. The intervening space is divided into ten equal parts, each one of which corresponds to one-tenth of oleomargarine, mixed with butter. More than six hundred experiments made by Messrs. Leune and Harburet with artificial mixtures show that, within an approximation of 10 per cent, the instrument gives correct results.

Soon after this areometric method was published, it was announced that the difference of the specific gravities of butter and of oleomargarine was too slight to distinguish the one from the other. As Messrs. Leune and Harburet had not stated what the specific gravity of each was, it was impossible to judge of the truth of this statement, and it became interesting to ascertain the facts of the case. The following process is the result of my attempts to determine the specific gravities of butter and of oleomargarine. I chose in the first place to ascertain the specific gravity of each at 15° C., which is the usual temperature for such determinations. The process consisted in finding for each a liquid in which, at 15° C., a portion of butter or of oleomargarine, freed from impurities by previous melting and containing no air bubbles, would remain in equilibrium in any portion of the liquid, without any tendency to rise to the top or sink to the bottom. The readiest liquid for this purpose was a mixture of alcohol and water, as this is easily prepared and it has no dissolving action on the fats to be tested. As the density of the liquid in which a body remains in equilibrium is the density of the body itself, the problem was narrowed down to finding the difference of density between two mixtures of alcohol and water of different strengths. It was found that pure butter, at 15° C., would remain in equilibrium in alcohol of 53.7 per cent. This corresponds to specific gravity 0.926. This butter was obtained from a gentleman, at whose country place the butter was made. I obtained oleomargarine from melted warm beef suet by pressure. At a temperature of 25° C. this expressed fat had the consistency of butter. The alcohol which at 15° C. would hold it in equilibrium had a strength of 59.2 per cent, which corresponds to a specific gravity of 0.915.

The question of the possibility of distinguishing butter from oleomargarine becomes equivalent to the possibility of distinguishing alcohol of 53.7 per cent, from alcohol of 59.2 per cent. As this difference is 5.5 degrees of Gay-Lussac's alcoholometer, it is very evident that the specific gravity is a sufficient character for distinguishing butter from oleomargarine. This difference may appear more clearly to persons not familiar with alcoholometry by stating that it is the difference between 0.926 specific gravity and 0.915.

By means of the tables of Gay-Lussac and of Tralles,* it is a very easy matter to prepare alcohol of the required strength at any temperature, to be kept in bottles for future use.

As the expansion of fats is different from that of alcohol, it is advisable to bring the alcohol to 15° C. when making an observation, which can be easily done by any one provided with a thermometer.

To deliver the sample of fat on the alcohol, I have found that the best plan is to melt the fat and let a large drop of it fall into the liquid. The fat should be melted in a little spoon or a little scoop, and the drop should be delivered by bringing the spoon or scoop close to the surface of the alcohol. It requires a little practice to do this neatly, so as not to get an air bubble in the ball of melted fat. When an air bubble becomes imprisoned in the fat, I have had no difficulty in removing it with a strip of paper, while it lies on top of the alcohol. Sometimes the globule of fat only partially sinks in the alcohol, the top of it becomes flat and remained exposed above the liquid. A slight tap on the side of the glass is then generally sufficient to form a wave and sink the globule.

* See the excellent tables of Prof. McCulloh.

If we take alcohol at 56½ per cent, which represents equal volumes of alcohol of 53.7 per cent, and of 59.2 per cent, and if we deliver on the surface of this alcohol a globule of melted butter and one of oleomargarine, the butter will sink to the bottom and the oleomargarine will remain at the top, while the two globules are still warm and liquid. Afterwards, if the alcohol has a temperature of about 30° C., the butter will become solid, while the oleomargarine may still remain liquid. Then the butter will rise to the top of the alcohol, which is due to the expansion of butter on solidifying. If the alcohol be then kept for a few minutes at 15° C., the oleomargarine will become opaque and remain at the top, while the solid globule of butter will sink to the bottom.

If instead of taking alcohol of 56 per cent we use alcohol of 59.2 per cent, oleomargarine will remain on top and butter will sink to the bottom at all temperatures above 15° C. At 15° C., oleomargarine will remain in equilibrium in any portion of the liquid in which it may be placed.

If oleomargarine was always sold pure, the foregoing indication would be sufficient to distinguish it from butter, but the oleomargarine found in the market is always more or less mixed with true butter to improve its taste and appearance. This being the case, alcohol of 59 per cent is not the proper liquid to detect oleomargarine. We should use alcohol of 55 per cent, and consider as oleomargarine any so-called butter which will not sink to the bottom in alcohol of this strength at 15° C. This is founded on the fact that no more than one-third of butter is ever mixed with oleomargarine to improve its taste and appearance.

Bearing in mind the experiments of Messrs. Leune and Harburet, already cited, the proportion of butter and of oleomargarine in a mixture could be easily detected by finding what strength of alcohol will hold in equilibrium at 15° C. a globule of fat under examination. As the difference of 59.2 and 53.7 is 5.5, the proportion of oleomargarine is the difference between the strength of the alcohol and 53.7, divided by 5.5, or more conveniently multiplied by 0.18. If the alcohol required to hold a globule of fat in equilibrium at 15° C. has a strength of 57 per cent, then : $(57 - 53.7) \times 0.18 = 3.3 \times 0.18 = 5.95$, or say six-tenths of oleomargarine. If the alcohol had a strength of 58, then $58 - 53.7 \times 0.18 = 4.3 \times 0.18 = 7.72$, or about eight-tenths of oleomargarine.

The proportions of butter and oleomargarine in a mixture may be also determined without the aid of an alcoholometer, by using the two solutions of 53.7 per cent and of 59.2 per cent. These may be placed in graduated glasses and poured cautiously into a third glass, until an alcohol of sufficient strength is obtained to keep in equilibrium a globule of the fat under examination at 15° C.

The relative volumes of the two solutions used in making the mixture give the proportions of butter and oleomargarine.—*Chem. News*, Dec. 30th, 1881.

On Yellow Oxide of Mercury.

J. COMERE noticing that many commercial samples of precipitated oxide of mercury differed in depth of color, made some experiments to ascertain the cause of this difference. As is well known, the oxide is prepared by treating a solution of bichloride of mercury with an excess of caustic potassa, carefully washing the precipitate, and drying it at a gentle heat. It is quite necessary to employ an excess of the alkali, so as to obtain a product free from oxychloride.

If the conditions are modified, the following results are obtained:

1. On employing solutions of bichloride of mercury and of caustic potassa, at the ordinary temperature, the product has a bright-yellow color.

2. If the solution of bichloride is at a temperature of 50° to 60° C. (122°–140° F.), and the solution of potassa at the ordinary temperature, the product has an orange color.

3. If the mercurial solution is boiling, and the alkaline

solution at the ordinary temperature, the product is darker in tint than the preceding.

4. If both solutions are brought together boiling, the deepest tint is produced.

A darker tint may also be imparted to the bright-yellow oxide prepared by cold precipitation, if it be boiled with a large quantity of water. The longer the boiling, the deeper will be the tint.

Brownish specimens of the oxide probably always owe this tint to the presence of oxychloride. At least, the author found the latter in all dark-colored specimens.—*Rép. de Pharm.*, 1881, 109.

Asbestos Filter.

K. TROBACH has patented a filtering apparatus (Germ. Pat. 12,745, class 12), which consists of an ordinary funnel, into the neck of which is placed a perforated cone *b*, and into which a perforated lining, *c c*, is introduced, after the inner walls of the funnel have been covered with asbestos. The lining is held in place by a clamp, *e*. The contrivance is useful, but, in our opinion, not new, and we fail to see where the patent comes in.

Cold Cream, or the Ceratum Galeni.*

THOUGH this article may not properly be termed a pharmaceutical preparation, it is yet one which at certain seasons is in such popular demand as to render it a matter of interest to the chemist and druggist. It is, besides, an article so susceptible of various changes, that, in spite of all that has been done to avert them, new efforts require to be made in order to secure a stable and uniform preparation.

Galen, the celebrated physician of Pergamos, is accredited with the invention of this well-known unguent. In ancient, as in modern times, it was compounded of very simple ingredients, viz., grease, water, and perfume, and (need we say) is known in pharmacy under the title of *Ceratum Galeni*. No doubt, very considerable changes have been introduced at different times into its composition, which have affected alike its odor and quality, yet practically the oleaginous ingredient with water has been retained during so long a period as seventeen centuries. We may safely conclude, however, that with all the appliances of modern times the article as prepared in our day must present a marked improvement on the ancient ceratum of Galen.

My object, at present, is not to trace the history of this esteemed preparation, nor to give an account of the manner in which any of the numerous formulas may be compounded; much less is it to give reasons for failure in the efforts of careful pharmacists, who have endeavored to effect permanent improvements in the article. Suffice it to say that we know from experience probably more than enough of such things. All I wish to advance is, that in presence of the difficulties which present themselves in connection with this ceratum I have been forced to the conclusion that it is impossible absolutely to secure, from the given ingredients of it, such qualities as are popularly expected. After careful consideration of past failures, I have ventured to inquire whether the difficulty might not be overcome by one or other of the recent discoveries in chemistry. Accordingly, several months ago, my attention was drawn to an entirely new agent, termed *white adepsine*,† a mineral product, which is manufactured under the superintendence of Professor R. Fresenius. The new agent in question is absolutely neutral, chemically pure, void of odor, and unaffected by the action or temperature of the air. It retains the perfect purity of its color after repeated exposure to heat, and it readily combines with oil, whether fixed or essential, in various proportion. Alone, or in substance, the *white adepsine* is rather hard, more particularly after it has been melted. By the addition of pale almond oil, and flavored with the finest otto of roses, a product is formed which may be termed *cold cream*.

I have prepared and supplied this article, and I find that it is universally liked, and that in point of adaptability it is all that can be desired. In my opinion, white adepsine is a product which will form an important factor in pharmacy, and will prove a boon to chemists. It will take the place (as I conceive) of other substances which have not been found so well fitted for certain special ends. I am well aware that this looks like the language of pretension. I am also aware of the common objection to new proposals. To adopt and introduce adepsine, it may be said, is to upset all our associations with an unguent in common use, from time immemorial. Admitting all this, it would be nothing strange to hear of constant changes in the annals of chemistry. It would be only one step more in the history of minerals or of the mineral oils. It is permissible to say, in a word, that if, by the means proposed, a new and better article is introduced, the change from an old to a new formula will, like so many others in our day, be more than justified by the results.

The *formula* which I have adopted is:

White adepsine	1 pound.
Pale almond oil	2½ ounces.
Oil of rose	½ drachm.

Melt the *adepsine* in a water-bath, then add the *oil*, and when it assumes a slightly opaque appearance, add the *otto*, and fill into pots in the usual way.

Should it be considered desirable to have the rose water added, it may be combined in the proportion of one part to seven.

Poisoning by Gelsemium.

IN the *Lancet* (Jan. 14th, p. 74), a case of poisoning by half a fluid ounce of fluid extract of gelsemium is recorded. The administration of brandy, and the hypodermic injection of atropine and carbonate of ammonium, the inhalation of nitrite of amyl, and the employment of electricity only aroused the patient for a time, death resulting within five hours after taking the poison. Dr. Seymour hopes that this case will direct attention to the necessity of determining the antidotes to gelsemium. As the chief feature in the poisoning by this agent is the loss of muscular power, the respiration being affected before the heart, the trial of strychnine as an antidote would seem to be indicated, death probably arising from asphyxia rather than from cessation of the heart's action. In the above case, the patient was a dipsomaniac, which might account for diffusible stimulants having less effects than usual.—*Pharm. Journ.*

Determination of Tannic Acid.

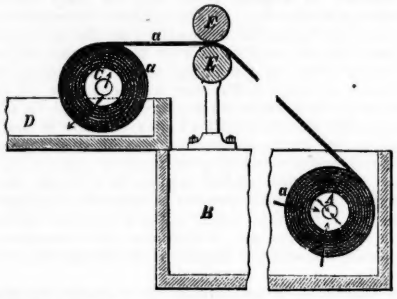
THE author takes a quantity of the sample supposed to contain from 2 to 6 decigrams of tannic acid. It is exhausted with boiling water, and the liquid is concentrated down to 100 or 200 *cc.* of filtrate. To 20 *cc.* of this solution are added 20 *cc.* of a saturated solution of ammonium chloride. The presence of this salt renders the separation of the precipitate both rapid and very distinct. Volumetric solution of gelatin is now carefully added, and the flow is stopped as soon as a precipitate no longer forms. To find the exact moment when the tannin is entirely precipitated, a small quantity of the liquid is filtered, and the filtrate is tested upon a watch-glass with solution of gelatin and with the solution of the sample. It should give no precipitate with either. The gelatin solution is standardized previously with a solution of pure tannin.—M. LEHMANN in *Jour. de Pharm. et de Chim.*, Sept., 1881, and *Chemical News*, Feb. 5th, 1882.

* By JAMES MACKENZIE. Read at a meeting of the North British Branch of the Pharm. Society. From *Pharm. Journ.*, February 15th.

† This is a colorless petroleum ointment.—ED. NEW REM.

Continuous Filter.

PAUL CASAMAJOR and CHAS. H. SENFF, of New York, have patented an ingenious arrangement for filtering liquids. *A* and *C* are two cylinders, the surfaces of which are perforated with numerous holes, and the axles of which are hollow. One of the cylinders, *A*, is situated in the liquid which is to be filtered; the other, in or over a tank of water. By means of a suction pump, the muddy



liquid in the tank *B* is forced through the different layers of filtering cloth into the hollow axle of the cylinder, and from there passes, as a clear filtrate, to wherever it is needed. The cylinder being slowly revolving, a clean surface of filtering cloth is constantly presented to the liquid. The clogged filtering tissue passes through a pair of rollers, *E E*, which deprive it of most of the liquid, and is gradually wound upon the cylinder *C*, where water is forced through the interior, and thereby cleanses the tissue.

The Proposed Extracts of the new French Pharmacopœia.

THE Codex of 1866 divided the official extracts into two classes, those prepared from the fresh plant, and those prepared from the vegetable substance in a dry state. The ninth Sub-Committee of the Société de Pharmacie proposes the abolition of the former class, with the exception of the juices from Rhus radicans, anemone, hemlock, and aconite, thereby following in the footsteps of the compilers of the British Pharmacopœia. They base their decision on the researches of M. Bretet and others, who have sought to prove that the juice extracted by pressure, or otherwise from the fresh plant has a much smaller value than the alcoholic or even watery extract of the dried plant; that the marc of the fresh plant is far from being exhausted, and will still give a certain amount of extract; that in many cases the marc contains even more of the alkaloids present in the plant than the juice or aqueous extract; and, finally, that the alcoholic extract contains more of the alkaloids than either. It is far from being proved, as asserted by some, that in the process of drying the plants lose a portion of their active principles, or that, by being dried, they are modified injuriously. The preparation of extracts from the green plants is often attended with great inconvenience, especially on account of their bulk and of being obliged to use them directly they are gathered. The ninth Sub-Committee has therefore proposed that, with the exceptions above referred to, there shall be only two classes of extracts, alcoholic and aqueous, both being made from the dried plant and with the portion containing most of the active principle. The extracts are also in all cases to be prepared by *displacement*. As far as consistence goes, the Sub-Committee recommends the soft extract as the most convenient form. The Sub-Committee made some rather sweeping changes in the way of abolishing certain extracts, but the Society, with great prudence, has given a new lease of life to the extracts of wormwood, centaury, bittersweet, quassia, saponaria, and lettuce, which were condemned to death by the Sub-Committee. The new alcoholic extracts are those of belladonna, aconite, hemlock, henbane seed, jaborandi, and ergot. The new process recommended for the extract of opium is much simpler than the old one. The aqueous extract is evaporated down to a certain consistence, allowed to stand for twenty-four hours, and filtered, the residue left in the filter being washed with water, after which it is evaporated down to the condition of a soft extract. The extracts of cinchona, which are very numerous in the present Codex, are reduced to six: alcoholic extracts of the red, gray, and yellow barks, aqueous extracts of calisaya and gray barks barks and a dry extract. The author very properly thinks that these six processes might with advantage be reduced to a single one, and made with water acidulated with hydrochloric acid, but the majority of the Sub-Committee thought otherwise. The process recommended was as follows:

Gray, yellow, or red bark..... .. 100 parts.
Distilled water .....6,000 "

Infuse coarsely powdered bark in boiling distilled water for six hours, express, filter, and evaporate to a syrupy consistence. Throw the residue into a displacement apparatus, and pour on it 1,000 parts of water acidulated with 100 parts of hydrochloric acid, and after six hours continue the displacement with an additional quantity of water until a drop of the liquid is no longer precipitated by ammonia. Precipitate with ammonia, collect the precipitate on a filter, wash with water, and redissolve in the smallest possible quantity of a ten-per-cent solution of hydrochloric acid. Add to the syrupy extract, and evaporate to a proper consistency over a water-bath. The great objection urged against the process was that by using hydrochloric acid the natural alkaloidal salts existing in the bark were not obtained, and that by using another solvent besides water, the therapeutical properties of the preparation were changed. These considerations carried the day, and the new Codex will be incumbered with six extracts of bark instead of one.—By M. CHAMPIGNY, in *Rép. de Pharm.* and *The Chem. Journ.*

The Presence of Disulphide of Carbon in Genuine Essential Oil of Mustard.

AN interesting law-suit has recently been instrumental in settling the fact that genuine essential oil of mustard *does* contain some disulphide of carbon as a natural constituent.

The well-known house of Schimmel & Co., of Leipzig, distillers of essential oils, had been compelled, in October, 1879, to purchase essential oil of mustard for supplying their customers, their own apparatus at the time undergoing necessary repairs. Accordingly, they obtained a supply from a Russian firm (only the initials are given: W. & R., in D., Government Saratow).

Already on opening the package, the presence of disulphide of carbon in considerable quantity was suspected, as the stopper was ejected with great violence. The oil began to boil already at 48° C., while the genuine oil boils at 148° C.; its spec. grav. differed from that of the true, and when distilled in the water-bath, a liquid passed over, which could be nothing else but disulphide of carbon.

The sellers of the article, on complaint being made to them, denied that the oil had been manipulated, and maintained that if any disulphide of carbon was present, it had been formed naturally in the oil. They demanded that the case should be submitted to the decision of Prof. Kolbe, of Leipzig, Prof. Flückiger, of Strassburg, and Dr. Hager.

The question to be settled was twofold: first, whether any disulphide of carbon is formed during the distillation of mustard-seed, and second, how the presence of the disulphide can be detected in the oil.

Prof. Kolbe found the suspected oil to boil at 48° C., at which temperature a colorless body passed over, amounting (with gradual rise of temperature to 100° C.) to 25 per cent of the original oil. The distillate proved to be mostly disulphide of carbon, as it gave the xanth(ogen)ate of copper reaction.

Prof. Flückiger found the spec. grav. at 20° C. to be 1.071. Between 40 and 60°, he obtained a distillate almost

devoid of the irritating properties of true oil of mustard. It boiled at 48° C., and was nearly pure CS_2. Dr. Hager obtained similar results.

Further testimony was solicited from Prof. A. W. Hofmann, of Berlin, and Prof. Will, of Giessen, both of whom stated that no formation of carbon disulphide had up to that time been noticed during the distillation of mustard from the seed, and its subsequent production, during the rectification, was impossible.

Subsequently, the firm W. & S. acknowledged the presence of carbon disulphide in the oil, but brought forward the excuse, that this must be owing to the different species of Sinapis (Sinapis juncea) which they grew in Russia.

Thereupon a quantity of genuine Russian mustard-seed was procured by Schimmel & Co., and worked up in presence of Prof. Stohmann, of Leipzig. It was then found that no carbon disulphide was produced either during the distillation or during the rectification.

A suit was begun against the sellers of the oil, and Prof. Hofmann testified that no disulphide of carbon could be detected in *any* of the natural essential oils of mustard (even the Russian) *by the process hitherto supposed to be the best* and generally used.

This process is the following:

Dissolve 10 drops of oil of mustard in 5 gm. of alcohol, add 15 to 20 drops of an alcoholic solution of potassa, and shake gently for about one minute. Now add acetic acid to distinctly acid reaction, and afterwards 3 to 5 drops of a solution of sulphate of copper. If the oil was pure, the color is at first dark, and the liquid, after shaking, is faintly turbid, with greenish to blue tint, depositing only a trifling white sediment (potassium sulphate) on standing. In presence of disulphide of carbon, the liquid becomes very turbid, and assumes a yellow to orange color, depositing a voluminous yellow or orange precipitate (cuprous xanth (ogen) ate with traces of cupric sulphide). If carefully following the proportions given above, about 1% of disulphide may be detected. Under all circumstances, the oil of mustard should first be dissolved in the alcohol, to prevent the occurrence of other interfering reactions. And the cupric sulphate must be added very cautiously for the same reason.

Prof. Hofmann, however, succeeded in establishing the presence of carbon disulphide in natural essential oil of mustard by the following methods, one of which is a modification of the one just given, and is only useful qualitatively, while the other may be used quantitatively:

1. *Qualitative method.* About 50 *gm.* of the oil are put in a large flask, standing in a water-bath. The neck of the flask is provided with a delivery tube dipping into alcoholic potassa, and a slow current of air is aspirated through both liquids. After a few hours, the addition of acetic acid and cupric sulphate produces an intensely yellow precipitate, proving the presence of CS_2.

2. *Quantitative Method.* The oil (or any other liquid suspected to contain CS_2) is heated in a tubulated retort on the water-bath, and the retort connected with a condenser, a receiver, and beyond this, with three wide test-tubes, containing each some solution of soda, and, floating on the latter, some tri-ethyl-phosphine. A stream of dry carbonic acid gas is now aspirated through the warm oil and the whole apparatus. If CS_2 is present, the tri-ethyl-phosphine in the first test-tube soon acquires a rose-color, and shortly afterwards aurora-colored prisms of the compound $(C_2H_5)_3$-PCS_2 make their appearance. The process is continued for several hours, and as soon as the contents of the third tube are seen to become tinted (which shows that the tri-ethyl-phosphine in the preceding two tubes is exhausted), the process is interrupted, the third tube is made the first, and more tri-ethyl-phosphine is added to the other two tubes. When the reaction is over, the crystals are collected upon a weighed filter, dried in vacuo, and weighed; 100 parts of the dry residue correspond to 39.1 parts of carbon disulphide.

Using these processes, Prof. Hofmann found that all natural essential oils of mustard contain a minute quantity of carbon disulphide, the largest observed quantity being 0.56 per cent.—*Phav. Zeit. f. Russl.*

The Manufacture of Chloride of Sulphur.

BY J. CARTER BELL.*

THIS substance is now largely used in manufacturing what is called India-rubber substitute;" and though there is a considerable demand for this article, and it is sold by the hundred-weight, yet any one consulting the chief works upon chemistry, or the price-lists of some of our largest dealers in chemicals, would come to the conclusion that chloride of sulphur could only be made in small quantities, and was thus a very expensive chemical to be used on a large scale; for in one list I see the price is nine shillings a pound, and in another list it is six shillings. With large orders at the prices named, a manufacturer would soon become a millionaire, for the cost of the manufactured article is about three pence a pound. A friend of mine requiring about half a ton of chloride of sulphur applied to me for assistance. I consulted all the best works, and they one and all gave the same process, that of passing chlorine over melted sulphur in a retort; this is very well if only a small quantity of chloride of sulphur is required; if it has to be made by the hundred-weight, this process is impracticable. I therefore had to devise some method which would not require so much care and attention as the above.

For simplicity, I will divide the "modus operandi" into three parts: the generation of the chlorine, drying the gas, passing the chlorine into flowers of sulphur.

Generation of the chlorine: I used a fifteen-gallon clay vessel, which was made by the potter specially for this purpose; it had only one aperture, which was two inches in diameter. In having another vessel made, I should prefer to have two holes three inches in diameter, exactly like a two-necked Woulff's bottle; the vessels which are kept in stock have holes four and five inches in diameter, and also have an outlet at the bottom. These holes are inconveniently large, and as the generator is in a water-bath, there is a risk of the contents of the jar finding its way into the water. The generator was put into an ordinary iron kitchen boiler, water was put in, and heated by a small fire. Into the generator was put twenty-eight pounds of manganese ore, in pieces of the size of a small nut, containing from seventy to eighty per cent of binoxide of manganese. A carboy of commercial hydrochloric acid was poured in, and the two-inch aperture closed with an India-rubber bung containing a piece of glass combustion tube bent at an angle of about 120°.

Drying the chlorine gas: A Woulff's three-necked bottle, gallon size, containing sulphuric acid, may be used. The tubes, if possible, should be ground into the apertures. In default of this, glass combustion tubing and India-rubber tubing slipped over the necks may be used. The sulphuric acid bottle is not absolutely necessary. When it is used, the chloride of calcium will last a much longer period without renewing. The bottle must have a safety tube. The sulphuric acid bottle is connected with a stone aspirator about five gallons in size. An India-rubber cork carrying a piece of tubing is put into the inlet at the bottom of the aspirator. The piece of tubing should be pushed through the cork into the vessel at a distance of two or three inches. The aspirator must now be carefully filled with chloride of calcium in pieces about the size of small nuts—no powder must be put in; an India-rubber cork carrying a tube must now be put in at the top aperture, which tube is connected with the vessel containing the sulphur.

Passing chlorine into sulphur: The vessels I used were wide-mouthed, blue glass gallon bottles; these were fitted with good ordinary corks. India-rubber must not be used, for the chloride of sulphur acts rapidly upon such corks, making them in a short time unfit for use. It would be better to use Woulff's bottles with ground glass tubes. The bottles are now filled with dry flowers of sulphur, taking care in the filling that room is left for the gas delivery tube. When the bottle is full, a hole should be made to the bottom of the bottle, by means of a wooden rod, about three-quarters of an inch in diameter. If this is neglected, and

* From *The Analyst*, February, 1882.

the delivery tube is pushed down through the sulphur, the tube becomes so filled with hardened sulphur that the gas has not a free passage. Two of these gallon bottles are connected together; the outlet tube of number two may be connected with an absorbing apparatus for waste gases. The apparatus being all connected and gas-tight, the water in the boiler may be raised to boiling heat; chlorine is abundantly given off, and after passing through the acid and chloride of calcium soon begins to act upon the sulphur, which becomes very hot, and abundance of chloride of sulphur is formed, which will be seen in the bottle as a dark-colored liquid with undissolved sulphur at the bottom. When the liquor has reached a strength of 136° Twaddle (spec. grav. 1.680), a new bottle of sulphur may be put in the place of number one; when chlorine ceases to be evolved, the spent acid may be siphoned off, and a new charge of manganese and acid introduced.

Such an apparatus like the one described could be fitted up for less than five pounds sterling, and will make at the very least one hundred pounds weight of chloride of sulphur weekly.

Apparatus for Washing Precipitates.

THE apparatus here described somewhat resembles that of Gay-Lussac, but answers the purpose more satisfactorily. A flask or plain bottle is fitted with a sound cork bearing two glass tubes of different calibre. One of these, *a b c d* is slightly narrower than the other, and serves for the admission of air. The other, *e f g*, is a little wider, and conveys the water to the filter. The first-mentioned tube is bent upwards at its lower end, the bend at *C* being on a level with the surface of the precipitate to be washed in the filter, and the short leg *d* rising to the level to which it is desired to fill the filter with water. On blowing air in the flask or bottle, through *a*, water begins

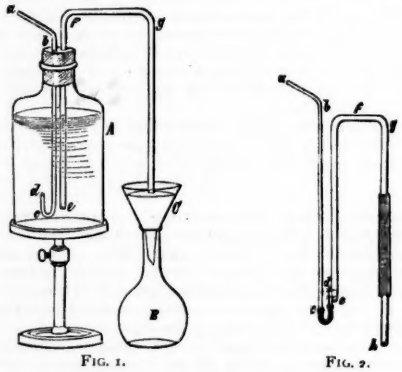


FIG. 1. FIG. 2.

Andrejeff's Apparatus for Washing Precipitates.

to pass over through the tube *e f g*, and continues to flow until the water in the filter is on a level with *d*. As soon as this point is reached, the flow stops; at the same time the water in the longer leg of the tube *b c* also stands on a level with *d*. This column of water gradually descends, in proportion as the liquid passes through the filter; and as soon as the water has reached the bend at *c*, air enters the flask again, and a new supply of water passes over in the filter. By varying the length of the knee *c d*, the intermission between the successive washings may be made longer or shorter. This may be readily accomplished by using a piece of flexible rubber-tubing, with a small additional glass-tube inserted in it, as shown in Fig. 2. The height of the point at *d* is then easily adjustable, by tying the little glass-tube to the inner leg of *e f* higher or lower.—M. ANDREJEFF, in *Chem. Centralbl.*, xii., 815, and *Pharm. Centralh.*, No. 5.

Salicylates of Mercury.*

H. LADOUX and A. GRANDVAL have published some studies on the salicylates of mercury, which salts appear to have hitherto been entirely neglected. Mercury forms two classes of salts, mercurous and mercuric; hence two salicylates of mercury may be expected to exist.

A. Mercuric Salicylates.—The first idea that would strike the experimenter would be to try and form salicylates of mercury by acting on salicylate of silver with mercuric chloride; but this method was soon found to be impracticable on account of the almost entire insolubility of the salicylates, which could not be separated from the chloride of silver. The authors consequently endeavored to prepare mercuric salicylate by double decomposition by acting on a boiling solution of mercuric chloride with normal sodic salicylate. On cooling, the reaction gave a relatively slightly abundant, white, amorphous precipitate, weighing 3 grams as against 13.5 grams of mercuric chloride.

Reagents, even hydrosulphuric acid, failed to indicate any trace of mercury in the liquid, which was acid. In fact, mercury united with salicylic acid is completely dissimilated, and in order to discover it in the wet way we must heat the mercuric salt with strong sulphuric acid until it becomes perfectly clear. Water is then added, and the liquid becomes colorless. The mercury present can then be easily detected by the ordinary tests. The analysis of the precipitate thus obtained showed it to be neutral salicylate, $C_6H_4.CO_2Hg''O$.†

This formula up to a certain point shows the reason why the metal is hidden, for the diatomic Hg″ links together the O and the group CO_2. As we have already stated, the precipitate only contains a small proportion of the mercury of the mercuric chloride which was used in its preparation, the rest being dissolved in the supernatant liquor, but in what condition? The properties of the precipitated salicylate will show, it being insoluble in water, soluble in a solution of common salt, and insoluble in salicylic acid. These properties show that the liquid ought to retain the greater portion of the salicylate of mercury on account of the sodic chloride formed by the double decomposition holding it in solution, the acidity being due to the free salicylic acid present. The reaction may be explained by the following equation:

$$2\,(C_6H_4.CO_2Na.OH) + HgCl_2 = C_6H_4.CO_2Hg''O + 2NaCl + C_6H_4.CO_2H.OH.$$

This reaction is very interesting from a theoretical point of view, for it shows that the neutral salicylate is more stable than the normal salicylate, a fact which contradicts the general opinion which has obtained up to the present time that normal salts were more stable than neutral salts.

The preceding experiment does not give an easy method of preparing mercuric salicylate. The authors therefore endeavored to produce this salt by acting on the yellow oxide of mercury with salicylic acid. According to theory, a molecule of salicylic acid should be made to react on a molecule of mercuric oxide, but in practice it was found that if a molecule of recently precipitated mercuric oxide is treated with a molecule of salicylic acid in the presence of water, and raised to the boiling point, no combination takes places, the yellow oxide still preserving its characteristic tint intact; but if, when the mixture has been raised to a boiling point, a fresh quantity of salicylic acid is added, the yellow oxide of mercury totally disappears when the quantity of acid added reaches a double molecule. On cooling, the mixture separates into two layers, the lower being amorphous and dense, the upper being formed of a crystalline mass consisting of interlacing needles of free salicylic acid. The whole is thrown on a filter, washed with boiling water, or better still with ether, which is a better solvent of salicylic acid. The washings should be continued until the ether shows no signs of containing any

* *Journ. de Pharm. et de Chim.*, and *The Chemist's Journ.*, March 10th.

† Salicylic acid is to be regarded as phenol (C_6H_5).OH, in which one atom of hydrogen is replaced by hydroxyl (OH), and another by carboxyl (CO_2H, or COOH), thus: $C_6H_4.COOH.OH$. And the two hydrogens in the two latter groups are replaceable by metals.

acid, a long and tedious process, which will try the patience of the operator. The amorphous matter left on the filter, which is dazzlingly white, consists, according to the author's analysis, of the salicylates already spoken of ($C_6H_4.CO_2HgO$).

To prepare this salt, double the quantity of salicylic acid indicated in the formula must be used. This remarkable fact confirms the equation which has been given above when speaking of the action of normal salicylate of sodium on mercuric chloride. Several properties of this body have already been given, such as the extinction of the mercury, its insolubility in water, alcohol, and ether, and its solubility in a solution of sodic chloride. It may be added that it dissolves in an aqueous solution of potassic iodide, and that it is extremely soluble in an aqueous solution of potassic cyanide. If a current of hydrosulphuric acid be passed through a solution of neutral mercuric salicylate in potassic cyanide, the liquid begins to turn black after a certain time and finally deposits a black precipitate of mercuric sulphide.

The normal mercuric salicylate is obtained by precipitating a weak solution of normal sodic salicylate in excess by a weak solution of mercuric nitrate. The white precipitate is collected on a filter and repeatedly washed with cold water, so as to eliminate the excess of sodic salicylate and salicylic acid which has been set at liberty by the free nitric acid. The washings should be continued until the filtrate no longer colors a solution of ferric chloride.

The composition of the above-mentioned precipitate corresponds to the formula of normal mercuric salicylate, which is as follows: $(C_6H_4.CO_2.OH)_2Hg''$.

This salicylate has all the properties of mercuric salts.

B. Mercurous Salicylates.—These two salts exist in an amorphous condition like those described above. The normal mercurous salicylate is obtained by double decomposition, like the preceding one, by precipitating salicylate of sodium in excess by a solution of mercurous nitrate as little acid as possible. The precipitate may be washed with boiling water without any danger of decomposing the salt, the analysis of which gives the following formula: $(C_6H_4.CO_2.OH.)_2Hg_2$.

The above formula shows the salt to be the normal mercurous salicylate, which behaves with reagents in the same manner as the ordinary mercurous salts. The normal mercurous salicylate, prepared according to the above directions, treated with ether in large excess, splits up into salicylic acid, which dissolves in the ether and neutral mercurous salicylate, which is insoluble both in water and ether. The operation is best completed by decantation, the washings being continued until the ether no longer gives a residue on evaporation. The following equation shows how this splitting up of the normal salt takes place: $(C_6H_4.CO_2.OH.)_2Hg_2 = C_6H_4.CO_2H.OH + C_6H_4.CO_2O.Hg_2$.

The salicylate thus obtained closely resembles serum after it has been treated with ether, and has a dark greenish color when it is dried at 212° F. It is blackened by alkalies, turns green with potassic iodide, gives mercurous chloride with hydrochloric acid; in a word, it gives all the reactions of the ordinary mercurous salts.

A Simple Dropper.

A VERY simple dropper may be made by bending a piece of glass rod at a right angle, and drawing one end out to a point. On inserting the other end into the bottle, and gently inclining the latter, some of the liquid will ascend along the tube, even before the liquid in the bottle has reached the mouth and may be dropped at will.

Citrate of Caffeine as a Remedy in Cardiac Dropsy.

DR. F. H. MILLIKEN reports, in the *Medical Times* of February 25th, a number of cases of cardiac dropsy in which the use of citrate of caffeine, in doses of three grains thrice daily, reduced the dropsy and improved the cardiac symptoms. In several cases of renal dropsy in which the remedy was tried, it failed to produce any good effect.

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INSANITY AND ITS TREATMENT. Lectures on the Treatment of Insanity and Kindred Nervous Diseases. By SAMUEL WORCESTER, M.D., Salem, Mass., Lecturer on Insanity, Nervous Diseases, and Dermatology at Boston University School of Medicine, etc. New York: Boericke & Tafel, 1882, pp. 462, 8vo; $3.50.

BESIDES the consideration of insanity proper, the work treats also of Idiocy; Puerperal Insanity; Epileptic Insanity; General Paralysis of the Insane; Hysteria; Hypochondriasis; Chorea; Catalepsy; Somnambulism, and the so-called Moral Insanity (which Artemus Ward would have called "Inherent Cussedness"). The question of non-restraint in the treatment of the insane is discussed, and the writer does not appear to differ from the opinion of most other American alienists that mechanical restraint is sometimes imperative, although it should be resorted to only as a last measure. Throughout the work the author quotes so largely from the writings of current authorities that the work will well serve as a guide to the knowledge of insanity as it now exsits.

In the matter of therapeutics, the author is a homœopathist in the main, but by no means ignores the value of remedies in common use. The work is written in entertaining style and handsomely published.

YEAR-BOOK OF PHARMACY. Comprising Abstracts of Papers Relating to Pharmacy, Materia Medica, and Chemistry Contributed to British and Foreign Journals, from July 1st, 1880, to June 30th, 1881. With the Transactions of the British Pharmaceutical Conference at the Eighteenth Annual Meeting, held at York, August, 1881. London: J. & A. Churchill, 1881, pp. 560, 8vo. 10*s.* plus postage (2 lbs.).

THIS annual epitome of the literature of the subjects embraced is one of the most valuable publications of the kind issued. Many of the papers presented at the Conference of 1881 have already appeared in our columns, but readers will find here others of interest, which our space would not permit us to reproduce, and which could not be well abstracted without injury.

Thirty-four new members were added to the Association. The report of the assets of the year show £532 9*s.* 10*d.* in the general fund, and £375 9*s.* 10*d.* in the Bell and Hill's fund.

HANDWÖRTERBUCH DER PHARMAKOGNOSIE DES PFLANZENREICHS. Herausgegeben von PROF. DR. G. C. WITTSTEIN. 8vo. Breslau, 1882. (Eduard Trewendt.)

THIS forms the second part of the second division of "Encyclopædie der Naturwissenschaften." Herausg. von Prof. Dr. G. Jäger (and seven other prominent specialists), published by Ed. Trewendt, of Breslau.

Prof. Wittstein has arranged his subject according to the alphabetical succession of the German names of the drugs. The German name is followed by the pharmaceutical name (where this exists), then by the botanical names (with synonyms), and lastly, the order both in Linné's and in the natural system. A description of the plant from which the drug is derived follows next, which is evidently drawn up with considerable care. This is followed by a brief description of the part used in medicine, an enumeration of the active constituents, and of the use of the drug. In our judgment, the space devoted to the description of the plant is out of proportion to that devoted to other subdivisions; particularly the account of the principal constituents appears to us to be too condensed and brief. Nevertheless, the information given is generally sufficient for all practical purposes. Some of the articles are treated in a particularly careful and excellent manner, having evidently been the subject of special study. One of these is by the hand of Prof. Dr. Garcke, in Berlin, and treats of cinchona.

The historical parts might have been made more exact by

including the important facts brought to light by the authors of the Pharmacographia. And the etymological efforts of the author not seldom lead him entirely astray (as, for instance, in the case of *Benzoë*, which he derives from two Hebrew words—one wrongly spelled, which have nothing at all to do with it). In all other respects, the work meets with our entire approbation, and it will certainly be a useful addition to any library.

NEW BOOKS.

Buchmann (Dr. O.). Mikroskopische und anderweitige Beobachtungen und Untersuchungen zum Nachweis der Löslichkeit von Metallen und andern harten Körpern, hauptsächlish in den Verdünnungen aus homœopathischen Verreibungen. 8vo, Leipzig, 1881.

Horatius (Dr. Th.). Die Fabrikation der Aether, und Grundessenzen. Die Aether, Fruchtäther, Fruchtessenzen, Fruchtextracte, Fruchtsyrupe, etc. 8vo, Wien (Hartleben). 3.25 *m.*

Kohlmann (B.). und **Frerichs** (Dr. F.). Rechentafeln zur quantitativen chemischen Analyse. 8vo, Leipzig, 1882, pp. 211. $1.10.

We draw special attention to this book, which contains tables calculated for every milligram between 1 gram to 1 milligram, showing by simple inspection the amount of analytical result sought from the quantity of the substance found. For instance, if 0.039 *gm.* (or any other quantity between 1.0 *gm.* and 0.001 *gm.*) of pyrophosphate of magnesium was found, a simple inspection will show either how much phosphorus this is equal to, or how much phosphoric anhydride.

Liebermann (Prof. Dr. Leo). Tabellen zur Reduction der Gasvolumina auf 0 Grad, und 760 or 1000 millimeter Quecksilberdruck. 8vo, Berlin. 1 *m.*

Schnetzlar (Karl) und **Neumann** (Dr. Franz). Die Medicinischen Geheimmittel, ihr Wesen und ihre Bedeutung. 8vo, Karlsruhe, 1881.

Weinhold (A. F.). Physikalische Demonstrationen. Anleitung z. Experimentiren im Unterricht an Gymnasien, Realschulen u. Gewerbeschulen. 8vo, Leipzig, part 3 (conclusion). 8.50 *m.*

Large Dose of Chloral Hydrate.

Dr. Madigan, of Brooklyn, N. Y., relates, in the *Chicago Medical Review*, a wonderful recovery from an overdose of chloral. Through the influence of friendship, a physician addicted to liquor and chloral both, obtained a situation as assistant physician in a prominent insane asylum of the east (name not given). During the absence of the other physicians, a patient was seized with a violent attack of epileptic mania, when the doctor in question administered from a vial in his possession *one ounce* of chloral hydrate dissolved in water, the patient sinking into a deep slumber within five minutes. The attendant's suspicion being aroused, medical aid was summoned, who applied the stomach pump, rinsing the stomach out with clear water, and then treated the poisoned man with hypodermic injections of whiskey and strychnine. It was, however, obvious to all present that the greater portion of the narcotic had already been absorbed in the circulation. The highly interesting part of the story is, that after a relatively natural slumber, lasting forty-eight hours, the patient recovered. Other than the prolonged slumber, no untoward results occurred, and no extraordinary phenomena presented themselves until the third day, when a vivid scarlatina form of eruption, involving the entire body, made its appearance, which fully desquamated within two days after its appearance. The patient's convulsions were fewer in number after his recovery from this excessive dose, but the buccal mucous membrane was for a long time markedly tender.

NOTES, QUERIES AND ANSWERS.

Under this heading we shall, to the best of our ability, endeavor to answer such questions addressed to us, as come within the scope of this journal, provided they are accompanied by the name and address of the writer. Answers to queries received after the 5th of the month will lie over until the next issue. Unless special instructions to the contrary accompany the query, the initials of the correspondent will be quoted at the head of each answer.

When asking for the formula of an unusual, patented, or proprietary compound, always accompany the query with any information you may already possess regarding the locality in which it is used, its use and reputed effects, in order to enable us to make inquiry without waste of time and labor. When it can conveniently be done, send also a specimen of the label used on packages of the compound.

No. 1031.—**Syrup of Lactophosphate of Calcium** (F.).

This syrup is generally, or probably always, prepared from the common tribasic phosphate of calcium, and, in consequence thereof, great trouble is often encountered in its preparation. It requires a considerable excess of lactic acid to keep it in solution, and, after being apparently well dissolved, will frequently deposit a portion of the salt again in a more insoluble condition than before. This may be prevented by substituting for the ordinary bone-phosphate of calcium the *bibasic* phosphate obtained by double decomposition.

Bibasic Calcium Phosphate ($CaHPO_4.3H_2O$). Dissolve 608 parts of crystallized calcium chloride in 10,000 parts of distilled water, and gradually add to it, while stirring, a solution of 1,000 parts of crystallized sodium phosphate in 10,000 parts of distilled water. Let the precipitate subside, wash five or six times by decantation with about 10,000 parts of water each time. Transfer the magma to a muslin strainer, and allow it to drain. As soon as its consistence permits, cut it into pieces, which should be exposed to the air on blotting-paper. It dries rapidly by spontaneous evaporation, and forms a very white and light salt. The above proportions yield 527.5 parts of the bibasic salt.

$$\underset{\text{Calcium Chloride}}{\underset{219}{CaCl_2.6H_2O}} + \underset{\text{Sodium Phosphate}}{\underset{358}{Na_2HPO_4.12H_2O}} = \underset{\text{Bibasic Calcium Phosphate.}}{\underset{190}{CaHPO_4.3H_2O}}$$

$$+2NaCl + 15H_2O$$

Sodium Chloride. Water.

Syrup of Lactophosphate of Calcium.

Calcium phosphate, bibasic	12.5 parts.
Lactic acid, a sufficient quantity, about	14 "
Distilled water	340 "
Sugar, in coarse powder	630 "
Spirit of lemon	10 "

Mix the calcium phosphate intimately with the water, add the lactic acid in just sufficient quantity to dissolve it; then add the sugar, and dissolve by agitation, without heat.

Another formula for the above is at present being experimented with, and will be given in one of our next issues.

No. 1032.—**Oil of Mirbane** (J. S. F.).

Nitrobenzol was first obtained by Mitscherlich in 1834, and was afterwards introduced into commerce as "huile de mirbane" by Collas. It is prepared on a very large scale from benzol, or a mixture of benzol and toluol previously freed from phenols or bases, by acting upon it with a mixture of nitric acid (44° Baumé) and sulphuric acid (66° B.), which is allowed to flow into it very gradually, under continued stirring. The operation is now usually carried on

in large cast-iron drums provided with mechanical stirrers. If pure benzol is treated, 100 parts of it require 118–120 parts of nitric and 200 parts of sulphuric acid; if benzol-toluol, 115 parts of nitric and 185 parts of sulphuric; and if toluol is used, 110 parts of nitric and 117 parts of sulphuric acid. When the acids are first added, the apparatus must be cooled off by water. Towards the end of the operation, which lasts eight to ten hours, the cooling is interrupted, and the temperature allowed to rise to 80° or 90° C., taking care during the whole reaction that not more than traces of nitrous vapors arise. After the reaction is completed, the liquid is allowed to separate into layers during one day, and the lower acid layer (1.6 spec. gr.) first drawn off; afterwards the nitrobenzol mixed with any unchanged benzol. The latter is driven off by steam, whereby some nitrobenzol is carried over likewise, but the mixture is utilized again in the next operation. The residuary nitrobenzol is then treated with an alkali, and thoroughly washed with water. The yield is 152 per cent in the case of pure benzol (the theoretical yield would be 157 per cent). It is finally rectified by distillation, either by itself or with steam.

Nitrobenzol is a pale-yellowish, strongly refractive liquid, of a peculiar bitter-almond-like odor, boiling at 210° C. (410° F.), and congealing, when exposed to cold, to large needles melting at 3° C. (37.4° F.). Its spec. grav. is 1.2002 at 0° C , and 1.1866 at 14.4° C. It is but slightly soluble in water, but easily soluble in alcohol, ether, benzol, and concentrated nitric acid. It is an excellent solvent of many other organic substances, among them many which resist the ordinary solvents. Steam volatilizes it readily, 1 part of nitrobenzol distilling over with 6 parts of water at a pressure of 1 atmosphere.

According to Grandhomme, the vapor of nitrobenzol has a more rapid physiological action than the liquid itself, which sometimes fails to act until from six to twenty-four hours after having been swallowed. Persons affected by it complain of burning in the mouth, pricking upon the tongue, nausea, and dizziness. The lips and face are slightly cyanosed. Aggravated cases exhibit, besides the above, symptoms of depression, such as coma, somnolence, anxiety, formication under the scalp, tingling in the ears, headache, and disturbances of co-ordination, such as staggering walk, stammering, reflex spasms, and convulsions; livid color of the skin; strong odor of bitter almonds from the mouth and vomited matters. Nitrobenzol is converted into aniline in the organism. Of 44 cases of poisoning, so far recorded in literature, 14 ended fatally.

Three kinds of nitrobenzol are distinguished in commerce.

1. *Light* or pure nitrobenzol, or nitrobenzol for blue and black. Boils at 205–210° C.; sp. gr. 1.2; prepared from the purest possible benzol. This is principally used in the manufacture of *pure* aniline for blue and black; also as an oxidizer in the manufacture of fuchsine, and in the preparation of some other coloring matters. This is also the kind used in perfumery as a substitute for the genuine essential oil of bitter almonds. For this purpose, it is often subjected to a repeated purification, by distillation with steam, or also by treatment with potassium bichromate and sulphuric acid.

2. *Heavy* nitrobenzol, or nitrobenzol for red. Boils at 210°–220° C.; sp. gr. 1.19. Consists of nitrobenzol (30–40%) and nitrotoluol (70–60%), and is chiefly used in the preparation of aniline for fuchsine (by the arsenic or mercury process).

3. *Very heavy* nitrobenzol, consisting almost entirely of nitrotoluol. Boils at 222°–235° C.; sp. gr. 1.67.

No. 1033.—**Hoffmann's Red Drops** (T. L.).

This name appears to have been used occasionally, but wrongly, to denote compound spirits of lavender. One of the popular names of this preparation was "red drops," and by a misunderstanding, the above name was thought to be identical with it.

The name, which appears to be not in common use, denotes the ethereal tincture of chloride of iron (tinctura ferri chloridi ætherea; spiritus æthereus ferratus; tinctura nervina Bestuscheff; tinctura aurea Lamotte, etc.). It is prepared by mixing 10 parts of solution of ferric chloride (sp. gr. 1.480) with 140 parts of spirit of ether (1 part ether, 3 parts alcohol), and exposing the mixture in long, tall, colorless glass-cylinders, well stopped, to the sunlight, until it has lost its brownish-yellow color. It is then placed in the dark, and the stopper occasionally lifted, until the color has returned to yellow or brownish-yellow.

No. 1034.—**Panawar-Djambi (Pinghawar Djambi)** (J. F. P.).

This substance consists of the long, golden-yellow or bronze-colored, and curly hairs growing upon the base of the fronds and the stem of certain species of farns in Sumatra and Java.

Panawar-Djambi (this the correct name) proper, is derived from *Cibotium Baromez* Kunze; *Cibotium djambianum* Hasskarl, and other species of Cibotium. That which is obtained from *Cibotium glaucescens* Kaulf., has usually another native name, but is also exported as Panawar-Djambi. That which is obtained from *Alsophila lurida* Endl. and a few other ferns go under the name *Pakukidang*. Other countries likewise furnish such products. For instance, the Sandwich Islands, from which the hairs of *Cibotium glaucum* Hooker have been exported in considerable quantities for stuffing pillows and mattresses. The substance in question has formerly been used as a means for staunching the flow of blood in fresh wounds.

No. 1035.—**Manufacture of Sugar of Milk** (J. W.)

The usual mode of manufacture of sugar of milk in Switzerland is a very simple one. The butter and casein having been first removed, the residuary whey is concentrated, and the liquid then allowed to crystallize, this crystallization being facilitated by the introduction of thin cords or sticks. It has, however, been found that a good part of the sugar is converted, during the evaporation, into uncrystallizable lactose, in consequence of the acid present. To avoid this, W Engling has recommended to neutralize the hot whey freed from casein with milk of lime, to evaporate to one-half, and then to permit it to settle. The clear whey is poured or drawn off from the sediment consisting of albumen and calcium phosphate, and is then further evaporated. The sugar separates, under these circumstances, in coherent plates and crusts, while the mother liquor furnishes a second crop of crystals on further concentration. The finally remaining thick liquid can be deprived of nearly all remaining sugar by dialysis. One gallon of summer-whey thus yields about five and one-third avoirdupois ounces of refined sugar of milk. Another method of concentrating whey consists in allowing it to freeze and removing from time to time the ice-crusts which are formed. This produces, in a short time, a concentrated solution purer than one obtained by evaporation, because the albumen, fat, and salts are mostly enveloped by the ice, which generally separates in thin scales covered with dentritic figures. In one experiment conducted in this manher the yieid was 1,660 grains from one gallon of whey.

No. 1036.—**Sticky Fly-paper** (T. P. A. & Co.).

This may be prepared by applying to stiff paper a thin layer of the following mixture previously melted together and liquefied by a gentle heat.

	Parts.
Resin	100
Turpentine or Burgundy pitch	50
Rapeseed oil or Linseed oil	65

No. 1037.—**Syrupus Sanguinariæ** (G. L. H. & Co.).

A good formula is the following:

Take of sanguinaria, in moderately coarse powder, 5 parts; sugar, 60 parts; dilute acetic acid, a sufficient quantity.

Moisten the powder with one-half of its weight of diluted acetic acid, pack it firmly in a conical glass percolator, and gradually pour upon it diluted acetic acid until the perco-

late weighs 40 parts. Then add the sugar, dissolve it by agitation, without heat, and strain.

No. 1038.—**Elixir Pruni Virginiani Ferratum** (E. L. B.).

The formula was given on page 155 of our volume for 1880, but instead of ten fluid ounces, it should have read one fluid ounce. We will repeat it:

Tasteless tincture of iron	1 fl. oz.
Fluid extract of wild cherry	1 fl. oz.
Elixir of orange	14 fl. oz.

Mix.

No. 1039.—**Tasteless Tincture of Iron** (E L. B.).

This preparation may be made in the following manner:

Solution of chloride of iron	8 fl. oz.
Citric acid	9½ troy oz.
Carbonate of sodium	18 troy oz.
(or a sufficient quantity).	
Water	8 fl. oz.
Alcohol, sufficient to make	32 fl. oz.

Dissolve the citric acid in the water, heat it to the boiling point, and neutralize with the carbonate of sodium. Mix this solution with the solution of chloride of iron, and add enough alcohol to make the product measure 32 fluid ounces.

No. 1040.—**"Carbolate of Iodine"** (B. B. L.).

This incorrect name is applied to a mixture containing iodine and carbolic acid in various proportions. If the quantity of iodine is small, the mixture gradually loses its color.

Holtz's formula:

Carbolic acid	5 parts.
Alcohol	5 "
Distilled water	25 "
Tincture of iodine	20 "

To be applied with a camel's-hair pencil in diphtheria.

C. G. Rothe's formula:

Carbolic acid	2 parts.
Alcohol	2 "
Tincture of iodine	1 part.
Glycerin	5 parts.
Distilled water	5 "

Twenty-five to thirty drops mixed with ½ to 1 fluid ounce of water, to be used in form of spray in diphtheria, etc. Or, it may be applied with a pencil.

Formulæ.—We have inquiries as to the exact composition of "Bromidia," "Reuter's Life Syrup," and "St. Patrick's Salve," and can only say that we have no further information than is conveyed on their labels or wrappers. Perhaps some of our correspondents will be able to supply the information.

Pulmonic Wafers.

Morphia hydrochlorate	30 grains.
Benzoic acid	60 "
Tartar emetic	10 "
Powd. squill	240 "
" ipecac	120 "
Black currant paste, q. s. ad	32 ounces.

Divide into lozenges of 15 grains each.—*Chemists' Journal.*

Diarrhœa Remedy.

PROF. WM. THOMSON, of the University of the City of New York, recommends the following as a remedy for diarrhœa:

℞ Plumbi acetatis	gr. xvi., 1.06 gm.
Pulv. camphoræ	gr. xij., 0.72 "
Pulv. opii	gr. iij., 0.18 "
Bismuth. subcarb	gr. xij., 0.72 "
Ext. gentian	q. s.

Make into 12 pills. Dose, one pill every hour to three hours, according to severity of disease.

NEW PATENTS.

[*Complete specifications and illustrations may be obtained of any one or more of the following patents by sending the number, title, name of patentee, and date of issue, with twenty-five cents for each copy, to the Commissioner of Patents, at Washington, D. C., together with the name and address of the person requesting the same.*]

251,678. *Machine for the Manufacture of Compressed Pills, Lozenges, etc.*—Jabez H. Gill, Philadelphia, Pa., assignor by mesne assignments to John Wyeth & Bro., same place.

9,993. *Magneto-Electric Machine.*—Arthur E. Briggs, Cincinnati, Ohio, assignor to Post & Co., same place.

251,720 *Atomizer.*—Rhodes Lockwood, Charlestown, Mass.

251,816. *Turpentine Still.*—Leonard Bellingrath, Castleberry, Ala.

251,908. *Cork for Bottles.*—Thomas R. Lowere, New York, N. Y. A cork having a hole made through it across its axis, and a slit which is parallel with said hole and reaches across the entire width of the cork, and the entire depth from its bottom to the said hole, for the reception of an extracting cord.

251,947. *Paint, White-wash, and other Brushes.*—James A. Read and Calvin D. Read, Ayer, Mass.

251,962. *Manufacture of Soda.*—Ernest Solvay, Brussels, Belgium.

251,992. *Process of Manufacturing Glycerin from Soap Liquor.*—Jesse P. Battershall, New York, N. Y.

10,004. *Manufacture of Cream of Tartar.*—Guido Schnitzer, Schwäbisch Hall, Würtemberg, Germany, assignor by mesne assignments to the Royal Baking Powder Co., New York, N. Y. The improvement in the art of treating argols to obtain a solution of the same, which consists in subjecting the argols while being dissolved to the pressure of steam, etc.

252,006. *Bottle-Stopper.*—Edward Aldom, Brooklyn, N. Y. The combination with a cork-stopper of a loop-shaped handle, the ends of which pass at or near the centre of the top part in an oblique direction through the cork, and then anchor to the sides of the cork above the sides of the same.

252,009. *Apparatus for Mixing Aeriform Fluids.*—John F. Baker, Springfield, Mass.

252,127. *Tongue Depressor.*—Edwin C. Merrill, Norwalk, Ohio.

225,155. *Recovery of Glycerin from Soap Lyes.*—Charles Thomas, William J. Fuller, and Sidney A. King, Bristol, England. Patented in England, March 31st, 1879. The process consists in throwing down from the lyes, by applying heat thereto, the greater portion of the salts suspended therein, then boiling the liquor with an excess of fatty acid, to effect the combination with the acid of the remaining salts, and, lastly, filtering the glycerin-liquor to remove therefrom the gelatinous and other impurities.

252,171. *Paint for Roofs.*—James B. Barnard, Garrettsville, Ohio. Consists of residuum, rosin, naphtha, and oxides of iron.

252,180. *Electrical Apparatus for Medical Use.*—John Butler, New York, N. Y.

252,209. *Hernial Truss.*—William H. Garson, Philadelphia, Pa., assignor to Hastings & Garson, same place.

252,216. *Elastic Compound for Truss Pads.*—W. Hendricks, Portland, Oregon. A plastic material composed of glue, honey, sugar, gutta-percha, glycerin, borax, alum, black lead, sulphur and saltpetre

252,217. *Rotary Sieve.*—William L. Heuser, Indianapolis, Ind.

252,385. *Rubber-Stamp Cabinet.*

252,452. *Indicator for Scales.*—Valentine F. Fulcher, Hughes Springs, Texas.

252,454. *Drop Bottle.*—Charles Gebert, Trenton, N. J.

A bottle constructed with longitudinal grooves diametrically opposite each other on the interior of the neck, in combination with a stopper having shoulders, adapted to cover and uncover the outer ends of the grooves.

252,539. *Bottle-Stopper and Fastening Therefor.*—George B. Stuart, Philadelphia, Pa.

252,555. *Disinfecting Compound.*—Dwight Warren, Winsted, Ct., assignor to himself and William H. Taylor, same place. Consists of sulphate of alumina, two and one-half parts, by weight; permanganate of potash, one part; and of bichromate of potash, one-fourth part. The first two, in the form of crystals, are mixed with the latter, finely powdered. In using, the mixture is dissolved and mixed with the material to be disinfected.

252,556. *Water-Closet Disinfecting Device.*—Dwight Warren, Winsted, Ct.

252,558. *Distemper Paint.*—William S. Welch and Littleton F. Welch, Westfield, N. J. To be used as a calcimine, consisting of a watery mixture of Paris white or other pigment, a size, and a solution in water of nitrate of soda, chlorate of potash and boric acid.

252,573. *Tumbler-Washer.*—Wallace H. Bate, Boston, assignor to James W. Tufts, Medford, Mass.

10,011 (Reissue). *Manufacture of Cream of Tartar.*—Edward Muller, New York, assignor by mesne assignments to the New York Tartar Co. The process of manufacturing cream of tartar from argols, which consists in exposing the argols in the presence of water alone in the proportions specified to the action of steam under pressure of about sixty pounds to the square inch; the steam being injected into the water, causing it to boil, and being permitted to escape from the converting vessel, and finally separating the cream of tartar after crystallization.

252,603. *Mucilage Receptacle.*—William Kumish, New York, N. Y., assignor to Sidney C. Thompson.

252,627. *Scale Platform Support.*—Wm. E. Sellick, Chicago, Ill.

252,652. *Alterative and Tonic Bitters.*—Daniel W. Edwards, Beloit, Wis. Fluid extract of hops, 1 pound; fluid extract of red cinchona, 8 ounces; fluid extract of sarsaparilla, 6 ounces; fluid extract of dandelion, 6 ounces; fluid extract of burdock, 6 ounces; fluid extract of yellock dock, 6 ounces; fluid extract of golden seal, 6 ounces; fluid extract of mandrake, 4 ounces; oil of wintergreen, ¾ ounce; oil of sassafras, ⅜ ounce; oil of lemon, ⅜ ounce; oil of horse-mint, ¼ ounce; granulated loaf or other fine clarified sugar, 6 pounds; alcohol (about 95%), 2 gallons, with pure water sufficient to make in all 12 gallons.

252,653 *Manufacture of Carbonate of Potassium.*—Charles R. Engel, Montpellier, France, assignor to the Society of Carbonate of Potash, same place. Patented in France, Dec 30th, 1880. The method of producing carbonate of potassium from other salt of potassium by forming a double carbonate of potassium and magnesium in the manner explained, and separating from said double carbonate by boiling or by heating in a dry state.

The method of obtaining a double carbonate of magnesium and potassium by treating by carbonic acid gas a mixture of carbonate of magnesium, or free magnesia, with an aqueous solution of a salt of potassium.

252,658. *Vacuum Pumps.*—Henry Goebel, New York, N. Y.

252,711. *Machine for Slotting Soap.*—James Atkiss, Brooklyn, N. Y.

252,723. *Compound for Flavoring Coffee.*—Frank Broz, San Francisco, Cal., roasted figs, vanilla, and honey.

252,762. *Galvanic Pad.*—Ludwig Hechinger, Rochester, N. Y.

252,782. *Manufacture of the Higher Homologues of Phenol, Naphthol, and Resorcin.*—Adolf Liebmann, Bonn, Prussia, Germany. The procees for the transformation of phenol, naphthol, and resorcin into their higher homologues, by subjecting them while in a suitable still to the action of the corresponding fatty alcohols in the presence of the chloride of zinc or similar metallic salts producing condensation.

252,823. *Corroding House for the Manufacture of White-lead by the old Dutch Process.*—W. H. Wutherill, Philadelphia, Pa.

252,846 and 252,847. *Preparations of Chinoline.*—Wilhelm Pickhardt, N. Y., and Hermann Endemann, Brooklyn, assignors to said Pickhardt and Adolf Kuttroff, N. Y.

255,849. *Bottling Machine.*—Richard Otten, Chicago, Ill.

253,936. *Nursing Bottle.*—Simon W. France, Brooklyn, N. Y.

252,982. *Manufacture of Soluble Alumina.*—James Webster, Solihull, County of Warwick, England. Patented in England, June 14th, 1881. The process, consisting in, first, roasting a mixture of aluminous material with carbonaceous matter; second, treating the compound with dilute acid, and allowing it to give off sulphuretted hydrogen; third, passing through the compound, while heated, a jet of steam and air to carry off sulphur and other substances; finally, boiling the residuum, and drawing the liquid off after cooling, thus leaving the soluble alumina behind as a precipitate.

253,014. *Nursing Bottle.*—Edmund O. Day, London, England. Patented in England, Oct. 28th, 1880.

253,045. *Process of Treating Ammoniacal Salts.*—Henri J. E. Hennebutte, Auglet, Department of Basses Pyrenees, France. Patented in France, June 15th, 1881.

253,143. *Apparatus for Manufacturing Sodium Hyposulphite.*—William H. Whitmore and George H. Pratt, Boston, Mass., assignors to said Whitmore.

253,209. *Surgical Needle Holder.*—George E. Jones, Cincinnati, O., assignor to William Autenrieth, same place.

253,261. *Means or Apparatus for Securing or Locking up the Contents of Bottles and other Hollow Articles.*—John Betzemann, England. Patented in England January 12th, 1881.

253,280. *Paint and Other Cans and Tubes.*—Frank R. Grout, Chicago, Ill.

253,360. *Combined Percolator and Still.*—Byron Turner, Westfield, N. Y.

253,377. *Manufacture of Aluminous Cake.*—Thomas S. Harrison, Philadelphia, Pa., assignor to Harrison Brochus & Co., same place.

253,378. *Recovering Volatile Solvents which have been used in Extracting Soluble Matter.*—Edward B. Hart, Strandtown, County of Belfast, Ireland.

253,427. *Bottle-Stopper Fastening.*—H. A. Chas. Kenauld, Brooklyn, and Marshall B. Stafford, New York, N. Y.

253,566.—*Bottle-Stopper.*—Charles A. Warfield, Philadelphia, Pa., assignor of one-half to Conrad Semper, same place.

253,594. *Hair Tonic.*—Lewis Forbes, San Francisco, Cal. The distillate of water and animal hides is obtained by subjecting distilled water and depilated hides to a boiling heat in a close vessel. The vapor arising is condensed. This is then mixed with alcohol and salt.

234,625. *Insect Destroyer.*—Francis T. Pinter, Schulenberg, Texas.

253,630. *Brush Supporter.*—Albert Rittmeyer, St. Gallen, Switzerland.

253,633. *Combined Measure and Funnel.*—O. Schorse, Milwaukee, Wis.

253,659. *Weighing Scale.*—John B. Atwater, Chicago, Ill.

253,722. *Apparatus for the Separation or Extraction of Oil from Vegetable Substances.*—Morris Lancaster, Richmond, Ind., assignor of two-thirds to Wm. N. Matthews and Wm. Mendenhall, same place.

253,734. *Furnace for Chemical Processes.*—James Mactear, Glasgow, Scotland. Patented in England Nov. 28th, 1879, in France, Dec. 16th, 1880, and in Belgium, May 23d, 1881.

253,796. *Bottle Cooler.*—Paul M. Wenther, Sioux City, Iowa.

254,036. *Measuring Faucet.*—John C. Norris, Crete, Nebraska.

ITEMS.

Massachusetts State Pharmaceutical Association.—The Essex County Pharmaceutical Association some time ago sent circulars to all the pharmacists and druggists of the State, suggesting the formation of a State Society, and inviting views and opinions on the subject. Some three hundred replies were received, among which there were only about a dozen which did not seem to favor the undertaking. Owing to the almost unanimous feeling, the members of the Essex County Association lately called a general meeting at Boston, at which some, more than thirty, of the most prominent members of the profession were present. At this meeting, two committees were appointed, one to name officers for the first organization, and the other to recommend a time and place for meeting. The latter was appointed to take place on May 17th, at Worcester, Mass.

The Kentucky Pharmaceutical Association will hold its annual meeting at Covington, Kentucky, May 17th and 18th. Exhibitors are requested to make application for space to P. Nodler, corner Fifth and Madison streets, Covington, Ky. W. B. McROBERTS,
Cor. Sec. Ky. Phar. Ass.

The Ohio State Pharmaceutical Association.—The fourth annual meeting of the Ohio State Pharmaceutical Association will be held in Zanesville, Wednesday and Thursday, May 17th and 18th, 1882, in Choral Hall. The first session will be called to order at 10:30 A.M.

The headquarters will be at the Clarendon Hotel.

This will be an unusually interesting and important meeting. Besides the reading of volunteer papers, answers to inquiries and the discussion occasioned by them, the Committee on Pharmacy Laws will present a bill for the consideraiton of the Association. As all are aware of the importance of a law, it is hoped there will be a large attendance.

Special attention is given to the display of drugs, chemicals, pharmaceutical preparations, apparatus, etc., etc., which is expected to be very fine, and will be held in a large room adjoining Choral Hall. All communications and applications for space, for which there is no charge, should be addressed to Dr. D. C. Peters, Zanesville.

All druggists in the State who are not members are requested to join. Blank applications can be had from any member.

All the hotels and railroads connecting with Zanesville have given special rates. LEWIS C. HOPP,
449 EUCLID AVE., CLEVELAND, O. *Secretary.*

Louisiana Pharmaceutical Association.—We have received copies of circulars from Mr. Jos. T. Thibodeau, of Thibodeaux, La., calling for a convention of pharmacists to meet in New Orleans, La., on the 24th of April to found a State Pharmaceutical Association. The lecture room of the medical department of the University of Louisiana has been offered for the meeting.

Pennsylvania Pharmaceutical Association.—The fifth annual meeting of this association will be held at Altoona on the 13th and 14th of June. Manufacturers of chemicals, pharmaceutical preparations and apparatus are invited to place their goods on exhibition, a large room having been secured for this purpose. Any further information desired in regard to the exhibition can be obtained from C. F. Randolph, Assistant Secretary, Altoona, Pa.
J. A. MILLER,
HARRISBURG, PA. *Secretary.*

Indianapolis Pharmaceutical Association.—In response to a call issued, a number of Indianapolis pharmacists assembled March 8th, at Merchants' Exchange, to make arrangements with the view of organizing a State pharmaceutical association. Col. Eli Lilly was chosen temporary chairman, and Jos. R. Perry, temporary secretary.

After the objects of the meeting had been stated and the various committees appointed, steps were at once taken to organize the "Indianapolis Pharmaceutical Association." A committee on constitution, by-laws, and code of ethics was appointed to report at a meeting to be held March 15th. At this meeting, Geo. W. Sloan was made chairman, and Jos. R. Perry, secretary.

The Committee on Constitution, etc., etc., made their report which was accepted, and the committee discharged. The secretary then read the constitution, by-laws, and code of ethics, which were adopted as a whole and signed by nearly all present. The secretary then read communications from nearly a hundred pharmacists throughout the State who signified their intention of attending the meeting May 9th, when, it is hoped, a State association may be organized.

Following this came the election of officers, which resulted as follows: President, J. B. Dill; Vice-Presidents, J. N. Hurty, H. C. Pomeroy; Recording Secretary, Frank H. Carter; Corresponding Secretary, John A. Lambert; Treasurer, H. Keilhorn; Executive Committee, Geo. W. Sloan, F. A. Bryan, C. H. Schade.

A motion made by Mr. Sloan to select a subject for general discussion at the next meeting was carried, and "emulsions" will be the subject for discussion at the next meeting, to be held March 29th. JNO. A. LAMBERT,
450 W. Michigan St.,
INDIANAPOLIS, March 17th. *Corresponding Secretary.*

Massachusetts College of Pharmacy.—MR. HENRY CANNING, the Secretary of the Massachusetts College of Pharmacy, has favored us with a programme of the exercises which were held at the fourteenth Commencement on April 5th. Valedictory addresses were delivered, Prof. Geo. F. H. Markoe speaking in behalf of the faculty, and Mr. James Henry Thompson for the graduating class. The following are the names of the graduates, and the subjects of their theses: Nathaniel Herbert Clark, "Gamboge;" Richard Barker Dawson, "Seidlitz Powders;" Henry Eugene Fleming, "Adulteration of Powdered Chinese Rhubarb with English Rhubarb;" Franklin Willard Freeman, "Lime Water;" Lyman Whitney Griffin, "Tinct. of Opium;" Daniel Hirth, "Syrup Senega;" Edgar Clarence Maxcy, "Tinct. Rhubarb;" Edward Franklin Otis, "Myrrh;" Edwin Ellis Ray, "Citrate Iron and Quinine;" Geo. Melzar Stetson, "Iron;" James Henry Thompson, "Liquor Potassæ;" Henry Thacher, "Syrup Iodide of Iron."

Mr. James Henry Thompson was granted his degree of Graduate in Pharmacy "with honors," for having taken and passed a satisfactory examination in the Elective Department of Practical and Analytical Chemistry.

The following gentlemen received the prizes in the Department of Pharmacy offered by Prof. E. L. Patch:

For recitations:—Junior Class, William R. Whittier, National Dispensatory; Senior Class, H. N. Hooper, Royle's Materia Medica, Wohler's Chemistry.

For written examinations:—Junior Class, F. E. Mayberry, National Dispensatory; Senior Class, R. B. Dawson, Attfield's Chemistry, Thomas' Medical Dictionary.

St. Louis College of Pharmacy.—The sixteenth annual commencement of the above college took place at the Liederkranz Hall on Thursday eve, March 16th, 1882.

A large and fashionable audience gathered to see the successful students obtain their hard-earned diplomas. After the St. Louis Grand Orchestra had played a few select airs, the President, F. W. Sennewald, delivered an address of welcome, and after giving a condensed history of the progress of the college, he then conferred the degree of Graduate in Pharmacy upon the following gentlemen:

Gust. H. G. Andreas, Albert P. Bentz, Chas. W. Benz, Geo. Billerth, Adolph Brandenburger, Thos. A. Buckland, Jr., Dennis A. Byrne, Otto Claus, Fred. B. Drescher, Conrad F. Denwel, Chas. W. Ferguson, Jas. G. Flint

Edward G. Gerding, Arthur T. Grindon, Gust. J. Hermann, Wm. A. Hitzelberger, Aurin B. Hunt, Lewis P. Kilbourne, Erwin J. Koeberlin, Wm. Ruhling, Louis F. Lehnherr, Theo. C. Loehr, Paul W. Schelcher, Wm. R. Schettler, Joseph P. Tierney, Jas. W. C. Weems, Ernest A. Woehrlin, Francis F. Zeller.

Honorable mention was also made of the following as having passed a highly creditable examination:

Junior Class: H. W. Whelpley, W. C. Kempinsky, Anton P. Hess, Chas. O. Borcher, Henry S. Brookes, J. S. Buff, Geo. H. Linking, Sidney J. Bass, Frank G. Kerr, O. K. Badgett.

Senior Class: Chas. W. Ferguson, Erwin J. Koeberlin, Dennis A. Byrne, Theo. C. Loehr, Chas. W. Benz.

The valedictory on the part of the faculty was delivered by Prof. Oscar Oldberg, who spoke in regards to the various changes which would take place in the new pharmacopœia. The valedictory on the part of the graduating class was then delivered by Mr. J. W. C. Weems who spoke in excellent style, and thanked the college and faculty for having given them the opportunity of becoming members of an honored profession.

The alumni medal was presented to Mr. James G. Flint, who had made the best examination in all branches.

A social hop then followed, and everybody tripped the "light fantastic" until the wee small hours in the morning.

W. O. BOLEN,
Corresponding Secretary.

California College of Pharmacy.—The opening of the session for 1882 took place on Tuesday, April 4th, at 8 P.M., at the Hall of the Academy of Science, S. W. corner Dupont and California streets. The introductory address was delivered by Prof. E. W. Runyon.

National College of Pharmacy.—The regular annual meeting of the college was held on Monday, April 3d, at the college hall, corner of Pennsylvania avenue and 4½ street. The reports of its officers and committees showed the college to be well supported and in a generally prosperous condition.

The report of the Treasurer, Mr. John A. Milburn, showed a decided decrease in the available funds of the the college, but "this result was brought about by the unusually large and necessary outlays required by the faculty for increasing the means for instruction." This officer also adds: "The means for instruction, and the expenses thereof, are such as to entitle and demand large classes, and it behooves every member of the college and every pharmacist in the city to use their utmost exertions and influence to fill the ranks of the students of this college during the coming year."

The following abstract from the report of the former Secretary, Mr. Charles Becker, shows some important changes in the *personnel* of the faculty: "At the May meeting of the Board of Trustees, Professor Oldberg tendered his resignation as teacher of Materia Medica and Botany, and Professor Read resigned the chair of Pharmacy. Both resignations were reluctantly accepted, and on ballot a new faculty was chosen, consisting of Professor E. T. Fristoe, as teacher of Chemistry, Mr. H. E. Kalusowski, as Professor of Pharmacy, Mr. H. B. Parsons as Professor of Materia Medica and Botany, and Professor A. M. Read as teacher of Analytical Chemistry, with Mr. A. F. Hofer as assistant.

Owing to the want of a separate room for instruction in the course of analytical chemistry, this branch had to be postponed until the close of the others, but it is to be hoped that by next fall arrangements will have been completed, so that the study of practical laboratory work and analytic chemistry may be continued simultaneously with the other branches.

After the reports had been read and disposed of, the college, with Mr. John A. Milburn in the chair, proceeded to elect its officers for the ensuing year, with the following result: *President*, Mr. W. G. Duckett; *Vice-Presidents*, Messrs. Chas. Becker and Karl Kullberg; *Secretary*, Mr. J. R. Walton; *Treasurer*, Mr. John A. Milburn; *Additional Trustees*, Messrs. W. S. Thompson, G. G C. Simms, R B. Ferguson, I. D. O'Donnell, A. M. Read, R. K. Helphenstine, and C. H. Nourse.

The annual commencement of the college will be held about the 1st of June, after the completion of the course in analytical chemistry.

J. R. WALTON,
WASHINGTON, D. C. *Secretary.*

Alumni Association of the Louisville College of Pharmacy—On the annual meeting held on the 14th of March, the following officers were elected: *President*, Edward Goebel; *Vice-Presidents*, Otto E. Mueller and William F. Tafel; *Recording Secretary*, Arthur J. Elway; *Corresponding Secretary*, Simon Flexner; *Treasurer*, Otto A. Beckman; *Executive Board*, B. Buckley, J. A. Flexner, E. Scheffer, Jr., J. F. Rudell, and A. J. Schoettlin.

College of Pharmacy of the City of New York.—Since our last report, the college has acquired, by purchase, the adjoining property, No. 213 East 23d street (25x100), a portion of which will soon be fitted up for a pharmaceutical laboratory. It is confidently expected that the facilities offered thereby to the students of the college will tend to largely increase the classes, and to make their training more thorough and practical.

The summer course in practical pharmacy at the above-named college will begin on May 1st. There will be two lectures by Prof P. W. Bedford each week, one on Monday evenings on Manipulation and Dispensing, and another on Friday evenings, beginning May 5th, on Pharmaceutical Chemicals, their manufacture and control of purity. Terms for either course $5.00, or for both courses, $7.50.

The summer course in botany has already commenced, under Prof. J. Schrenk, but may still be entered.

PHARM. CALENDAR FOR MAY.

N. B.—The officers of Societies, Colleges of Pharmacy, Pharm. Associations, etc., will oblige us by forwarding schedules of their meetings, lists of officers, and any changes that may be desirable.

Date.	Society Meetings.
Mon. 1st.	New York Coll. Pharm.—*Summer course in Pharmacy begins.*
	Erie Co. Pharm. Asso.—Meet at Buffalo.
Tues. 2d.	Philadelphia Coll. Pharm.—Trustees' M.
	Maryland Coll. Pharm.—Trustees' M.
Thurs. 4th.	Louisville Coll. Pharm.—Pharm. Meet.
	New York Coll. Pharm.—Trust. Meet.
	Massachusetts Coll. Pharm.—Trustees' M.
Frid. 5th.	Cleveland Pharm. Assoc.—Annual Meet.
	American Chem. Soc.—Monthly Meet.
Tues. 9th.	Pittsburg Coll. Pharm.—Trust. M.
	Chicago Coll. Pharm.—Trust. M.
	St. Louis Coll. Pharm.—Pharm. Meet.
	Massachusetts Coll. Pharm.—Pharm. Meet.
	Kings Co. Pharm. Asso.—Meet. at Brooklyn.
	National Coll. Pharm.—Meet.
Wed. 10th.	New York Board of Pharm.—Meeting.
	Texas State Pharm. Assoc.—Annual Meet.
Thurs. 11th.	Newark Pharm. Asso.—Meet.
	Louisville Coll. Pharm.—Direct. Meet.
	Philadelphia Coll. Pharm.—Alumni Ph. M.
	Maryland Coll. Pharm.—Meet.
	New York German Apoth. Soc.—Meeting.
Tues. 16th.	St. Louis Coll. Pharm.—Trust. & Alumni M.
	Philadelphia Coll. Pharm.—Pharm. Meet.
Wed. 17th.	Ohio State Pharm. Assoc.—Annual Meet. at Zanesville.
	New Jersey Pharm Assoc.—Annual Meet. at Atlantic City.
	Kentucky Pharm. Assoc.—Annual Meet. at Covington.
Tues. 24th.	Boston Druggists' Assoc.—Monthly Meeting.